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No. XXIII. OF VOL. II., 1922. LONDON, SATURDAY, DECEMBER 2, 1922. Pp. 120—Price 1s.
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SENIOR ANÆSTHETIST TO THE ROYAL WATERLOO HOSPITAL, ST. PETER'S HOSPITAL, ETC.

IN this lecture I intend to consider only the medico-legal position of the holder of a diploma, who gives an anæsthetic for some purpose, such as the performance of an operation or the relief of pain. There are important questions—for instance, the possibility of forcibly anæsthetising someone in order that a crime may be committed, or the use of anæsthetics by unqualified persons, but these seem to me to be beyond its scope, and are fully dealt with in certain books on forensic medicine and anæsthetics. Other equally important questions are, in most of these books, hardly noticed or quite ignored. In a work of over 500 pages lately published I find on consulting the index *one* reference to anæsthetics. This "discusses" responsibility in a death from anæsthetics, stating in about three lines that such a death will be judged by the same rules as a death from an operation.

SURGEON AND ANÆSTHETIST.

Whilst an anæsthetist is bound by certain rules—obligatory by statute or Common Law, or by custom and moral law—that govern the conduct of all registered practitioners, as regards his special duties his position is ill-defined and subject to circumstances. This is to a great extent due to the fact that it is only within the last 30 years or so that he has been acquiring some independence, and there are few authoritative decisions available for guidance. Formerly, operations were comparatively few and simple. The surgeon took entire responsibility, and supervised the administration of the anæsthetic besides performing the operation, and the anæsthetic was, in fact, often administered by an assistant or by some unqualified person. Even now such conditions may be unavoidable in emergencies, but the obligations of both operators and anæsthetists have so extended that the majority of surgeons prefer to work with one to whom they can give a free hand, and, indeed, it is often impracticable for them to do otherwise, because their own work requires unremitting attention.

It is now generally considered that the anæsthetist having to observe the patient's general condition should warn the operator when this is unsatisfactory whether from the anæsthetic or otherwise. The responsibility of the surgeon being thus diminished, he can hardly expect that his authority should remain as before.

Some irreconcilable difference of opinion may arise between surgeon and anæsthetist with regard to the anæsthetic or method to be employed. Dr. Dudley Buxton has suggested [1] that under such conditions the anæsthetist should retire, unless he had been specially called in by the patient or the practitioner, in which case he is on the same footing as the surgeon. It may also happen that differences of opinion arise as to the course to be pursued in some emergency—for instance, the entry of fluid into the air-passages, or the completion of an operation when the patient is in a desperate condition, or when the operator or anæsthetist has shown himself to be very incompetent. One cannot lay down any general rule about such cases, because the respective professional or official standing of the anæsthetist and the operator and their previous relations to the patient may widely differ. The operator may offer to assume all responsibility but it cannot be thus shifted unless the anæsthetist is legally under his control. Such disputes can generally be averted by explanation and forbearance, but may persist when the operator or anæsthetist is inexperienced, prejudiced, or too much inclined to consider his own aims and his own security without due regard to the effect of his proceedings on his colleague's work and effect of both on the patient. The need for unselfish "team-work" is not always realised.

CONSENT.

As a general rule, no person can be legally anæsthetised without consent, obtained in the case of a child from the parent or guardian, and in the case of an insane person from someone who has authority to give it. Anæsthetisation, without consent, would be as much an assault as the performance of an operation without consent. If there are peculiar risks in taking an anæsthetic, one should give some warning to the patient, but people ought not to be alarmed by discussing remote possibilities. It has been decided in a foreign court of law that failure to impress a patient that there is risk of death from any anæsthetic is not a culpable omission, since in all but exceptional cases the risk is small and there is common knowledge that it exists; and that an increased risk would be thereby caused to an impressionable patient.[2] Difficulty may arise when a person is not in a condition to give consent on account of delirium, shock, or intoxication, and in the case of a child if the parents cannot be immediately communicated with, and the operation is urgent—in such circumstances the anæsthetist can only do as the surgeon generally does, and be guided by circumstances that may make the performance of an operation under an anæsthetic justifiable, although possibly illegal. It is advisable that consent should be given in the presence of a witness, more particularly if the patient is able to talk and understands what is said, but still is not in quite a normal condition. For instance, one under the influence of a narcotic may consent, apparently with clear understanding, but afterwards have no recollection of having done so.

Until recent years it was considered that the power of a parent to withhold consent in the case of children was absolute. Parents have, however, been convicted for withholding operations needed to improve health, and so one may assume that an operation to save life, for instance, in a case of strangulated hernia, may be legally performed, even if the parents object. One must not forget that many young people, 20 years of age or so, though practically independent of their parents, are still legally infants. A case in Canada some years ago turned on this point. A patient agreed to an operation not absolutely necessary, but his parents had not consented, and brought an action against those who were concerned. The case was decided against them, but rather on its own merits than for any reason of general application. Consent may have been given by an adult who changes his mind immediately one starts to give the anæsthetic. Then the anæsthetist must desist. If the anæsthetic has been taken to such a degree that one may reasonably suppose that the power of judgment has been lost, one is justified in going on in spite of protests. Sometimes a surgeon finds he cannot keep within the limits of the operation intended, or he may find that he has to give it up and do a different one, perhaps a more serious one. He may, for example, have to do lithotomy instead of litholapaxy. The anæsthetist is probably entitled to assume that consent has been obtained to a possible variation, but if he is aware that the consent has been strictly limited, he may get into trouble if he aids the surgeon to do something of which the patient or the patient's relatives may afterwards disapprove, or which may even result in a fatality.

PRESENCE OF A WITNESS.

An anæsthetic should never be given except in the presence of a third person. There are at least three good reasons for that rule.

[1] THE LANCET, 1908, i., 151.

[2] See Glaister's Medical Jurisprudence, 1921, p. 755.

(1) Actions have been brought for alleged administration without consent—the patient and the anæsthetist, who was also the operator, being alone together—and though these actions have failed on the grounds that the anæsthetic could not have been fully given by force, and that there was collateral evidence of consent, it is obvious that the anæsthetist-operator may be unable to prove this, and he would, at any rate, be exposed to considerable trouble and expense and have to make up a defence.

(2) Difficulties and dangers may arise during any administration, even when it is expected to be quite simple. If struggling occurs the anæsthetist or patient may be injured, and in the latter event there may be an action for damages. Various mishaps, vomiting, asphyxia, and so on may make assistance essential at a moment when it is impossible to procure it. Supposing there is no third person present, in the event of a fatality, the anæsthetist would be severely blamed, if no more serious consequences befell him.

(3) In the case of a woman, the presence of a third person is especially important, because any anæsthetic may cause an erotic hallucination, either during induction or during recovery, and an accusation may be made afterwards with perfect good faith—or, without any such excuse, it may be made for the purpose of extortion.

"REASONABLE CARE AND SKILL."

No one may give an anæsthetic for an illegal operation, and it is also likely that one might get into trouble by giving an anæsthetic for a fraudulent or otherwise indefensible operation. Nor may one give an anæsthetic for the purpose of "covering" or assisting persons without legal qualifications, even when they make no pretence to possess them. The admission to the Dentists' Register of all bona fide practising dentists has in this respect eased the position with regard to such not holding diplomas. As to charges of malpraxis or civil actions for damages—in a general sense every registered practitioner is entitled to administer an anæsthetic, and as defence against a charge of malpraxis is only required to show its necessity and that he exercised reasonable care and skill in so doing. But there is no exact definition as to what constitutes reasonable care and skill. A higher standard of skill, although not a higher standard of care, would reasonably be expected from one who holds a hospital appointment as an anæsthetist. If anyone who may be supposed to possess only the average skill of a practitioner gives an anæsthetic where no unusual difficulty could be expected, or if he gives it even when obviously risky, but for some good reason no specialist can be engaged, he would not be liable for any disaster in a criminal sense, unless it could be shown that he displayed extreme ignorance or carelessness. On the other hand, it is quite possible in the present day that if one who has only average skill undertakes this task when the benefit of special knowledge is required and could have been obtained, he may be penalised in some way in the event of any ill-effects ensuing, unless he is acting under the orders of someone in authority, such as a house surgeon directed by his chief, or an assistant directed by his principal. It has been suggested that when this is not the case, not only the anæsthetist but also the surgeon who engaged him or permitted him to give the anæsthetic may find himself in difficulties from a medico-legal point of view. Therefore any practitioner who is doubtful about his ability to give anæsthetics ought to study not only the patient's interests and his own, but also those of the surgeon.

One of the conclusions at which a Commission on Anæsthetics arrived a good many years ago was this—that in many cases an anæsthetisation is of such importance and gravity that it is absolutely essential it should be conducted by an administrator with large experience. If that conclusion was justified when it was written, it is even more justified at the present time, because for a large proportion of the operations now performed special skill and experience are as necessary in the anæsthetist as in the surgeon. It need hardly be said that some practitioners are excellent anæsthetists, just as some practioners are excellent operators, but it is not possible for the majority to deal successfully with those cases that require special training and experience. Although a faulty administration is not often the direct cause of death, one hears much too often of cases in which it has caused considerable anxiety and materially delayed the operation and interfered with its success.

The apportionment of responsibility between the surgeon and the anæsthetist in the event of disaster has not recently been determined in court. Formerly it was, as I said, customary to consider the surgeon solely responsible for the actions of all those taking part in the proceedings. But it is unlikely that at the present day this view would still be taken. It may be supposed that legally, as practically, the surgeon's responsibility has diminished and the anæsthetist's has increased.

Disasters consequent upon anæsthetisation, apart from death, may be slight or may be serious. For instance, a tooth may be broken from forcibly opening the mouth; injury may be sustained in struggling, or bruising of the tongue from dragging and clamping; or something very serious, such as the loss of an eye from movement of the head (the patient being incompletely anæsthetised) or actual inability of the surgeon to complete the operation; or after-effects, such as persistent vomiting, more or less due to some mistake made in the way in which the anæsthetic has been selected and given. The anæsthetist may then find himself a defendant in an action for damages, although, supposing death to have occurred, there may have been no prosecution for manslaughter, nor any probability that if there had been one there would have been a conviction. He may also be called as a witness in an action brought against the operator—for instance, when a swab has been left in the abdominal cavity, or in an action against an insurance company, or against employers under the Workmen's Compensation Act, and in many other ways.

It has been suggested that if the anæsthetist is very much afraid of this kind of thing happening he should get the patient to sign an indemnity freeing him from responsibility. But that would be of hardly any value from a legal point of view, because it would not afford any protection against the consequences of wrong-doing. It would only indicate that a patient had been warned that risks existed; one need hardly say that a nervous patient would be extremely alarmed by any request of this sort, and altogether it is not to be recommended. An anæsthetist on the staff of a hospital is not by his position exempted from an action brought by a patient for negligence, either his own or that of a student under his supervision. The hospital authority would not be liable, having discharged its duty to the patients by due care in appointing members of the staff.

THE ANÆSTHETIST'S EVIDENCE.

In giving evidence the anæsthetist should follow the general advice given in books on forensic medicine. He ought to study the subject of inquiry very carefully beforehand and consider what questions are likely to be put to him, and how his evidence may be regarded by anyone outside the medical profession. He must remember that he will have to deal with a coroner who may have had no medical training, or with a judge and counsel and jury who certainly have had none, and that an answer which would satisfy a board of medical experts may not satisfy such a tribunal; he should consider any weak points that may be seized upon to his disadvantage. If he goes before the coroner or before a magistrate or a county court judge, he ought to remember that the case may be carried further and copies of the evidence given may be produced, and there should be no discrepancies from carelessness or lapse of memory between the evidence given on the two occasions. He should answer deliberately and distinctly, carefully avoid any approach to levity, irritation, or discourtesy, and,

as far as possible, reply in simple language free from technical terms and from vague and exaggerated expressions. As far as possible, he should give plain answers to plain questions, not stray beyond the question asked, and confine himself to facts, or to comments on facts disclosed in evidence if summoned as an expert witness. Objection should be made to any questions that are involved or suggestive, or depend upon some hypothesis, and if a brief answer such as "Yes" or "No" would be misleading, he should ask to be allowed to give an answer which would be more satisfactory. If in doubt he should not evade the question, but say he is in doubt, and give his reasons for being in doubt; also avoid expressing any decided opinion when the data are insufficient—e.g., not give an opinion about the cause of death in the absence of a post-mortem examination, preferably made by a skilled pathologist, even when this has apparently been unmistakable. Instances have occurred of sudden death (from embolism, rupture of aneurysm, &c.) which might, but for the autopsy, have been attributed to the anæsthetic.

Lastly, we come to the coroner's court. Some coroners always hold an inquest when death occurs during anæsthesia, and some consider they are entitled to exercise discretion. Some coroners are extremely good and impartial, and know all they can about the subject in the absence of practical experience. Some, unfortunately, are just the reverse. A coroner's jury is obviously unfit to decide in what ought to be a scientific investigation. The consequence of all this is that an anæsthetist who has really been very much to blame may get off scot-free, whereas one who done his best in difficulties, and is perfectly competent and careful, may find his reputation considerably damaged. That is evident from the reports that one reads in the newspapers of inquests on people who have died under an anæsthetic. Some few years years ago the Coroners' Society drew up a series of questions. Dr. F. J. Smith, in "Taylor's Medical Jurisprudence," dubbed it with vigorous criticism "The Coroner's Catechism," and it is also condemned in the new edition of "Hewitt's Anæsthetics and their Administration."

"THE CORONER'S CATECHISM."

I quote it because such questions may be asked not only in the coroner's court, but at other investigations.

1. What anæsthetic or anæsthetics were employed, and what influenced your choice?—Fatalities and troubles short of fatalities are very often due to a faulty selection of the anæsthetic. Something may be given which is unsuitable either to the particular patient or the particular operation or to the position in which the patient is to be placed, or some other condition. For instance, nitrous oxide may be given to an elderly full-blooded person for the opening of a tonsillitic abscess. Chloroform may be given to an anæmic girl for the extraction of a tooth. Fatalities have occurred in such cases. If a new or unusual drug or method have been used, a severe inquiry may be expected.

2. When and where was the anæsthetic administered?—State if in an operating theatre, casualty room, out-patient department, or private house.

3. What was the temperature of the operating room?—Had the room, previous to the operation, been well aired?—(It is the duty of the anæsthetist to attend to the general welfare of the patient and the purity and temperature of the air.)

4. Was the anæsthetic given by artificial light?—State what kind. If gas, was the flame exposed?

5. For what purpose was the anæsthetic administered?—State the nature of the operation, with name and address of the surgeon operating.

6. How many patients were placed under anæsthesia by you that day, and how much time was occupied in producing complete anæsthesia in each case?

7. Was there any, and, if so, what reason for administering the anæsthetic quickly?

8. How was the anæsthetic administered?—If by means of an inhaler, state what kind and make.

9. How was the mixture of air with the vapour of the anæsthetic secured, and in what proportion?

10. What quantity of the anæsthetic was used (*a*) from the beginning of the administration until complete anæsthesia was produced; (*b*) from then until the administration was stopped? Was the anæsthetic supplied by drops or measurement?—The question about quantity is constantly asked. If a small quantity, especially of chloroform, has been used, the coroner and jury seem to think it quite satisfactory. If a comparatively large quantity has been used, they seem suspicious, not knowing how the amount used, particularly if given by the drop method, may be influenced. For instance, in anæsthetising a person whose breathing is shallow, the patient takes a long time to go under, and comparatively a large amount is used, although only a little of that is really absorbed, and a good anæsthetist may use more than a bad anæsthetist, because he will go on steadily. Again, the small quantity may be due to the fact that the operation was begun too soon, the patient being imperfectly anæsthetised, and therefore more liable to shock.

11. How was the deceased prepared for the anæsthesia as regards food, clothing, and so forth? Was there mechanical or other obstruction to the respiration?—Proper preparation of a patient for anæstheia is extremely important, and in emergency operations it is essential to inquire when the last meal was taken, and of what it consisted. There is one recorded case in which a man had been assaulted, and it was necessary to give him an anæsthetic in order that his wound might be examined. The anæsthetist made this inquiry, and was told that he had his last meal many hours before. However, the man, during the giving of the anæsthetic, vomited undigested food and was choked and died. The man who had assaulted him was consequently put upon his trial for manslaughter, but when it was stated that the deceased person had deceived the anæsthetist he escaped conviction. If the anæsthetist had not put the question, or if the patient had answered him correctly, there would have been a very different result.

12. What was the condition of the heart, lungs, and kidneys of the deceased previous to the administration? Were you satisfied that the patient was in a safe condition to be placed under the anæsthetic? Had the patient previously been anæsthetised?—A patient may be in a safe condition to be "placed under an anæsthetic," but it does not follow that he is in a safe condition to undergo an operation under an anæsthetic. (See questions 13 and 19.) The necessity for the operation would have to be proved if the patient's state was unsatisfactory.

13. Was the deceased, at the time of the administration, suffering or recovering from any acute or chronic illness, or from alcoholism?—One must, I suppose, take it that this refers to some illness additional to the one that necessitated the operation. (See questions 14 and 19.)

14. Was the deceased excited or violent during the first stage?—There is very good reason for asking this question, because violent struggling at the onset may have an effect on the heart that continues after the struggling has ceased, and may result in failure later on. Alcoholic persons, I need hardly say, are particularly bad subjects; they need much anæsthetic to get them under, they commonly struggle very violently, and their hearts are, at any rate, after middle age, in a degenerated condition, and very apt to become over-dilated and give out altogether.

15. Was the pulse and respiration watched during the administration, and if so, by whom? State the conditions observed. What was the state of the pupils and of reflex irritability generally?

16. At what period, during the administration of the anæsthetic, was the first symptom of impending death noticed? What was it? Did the deceased vomit at any time? If so, when and how often?

17. Did the deceased die during the administration of the anæsthetic? If not, how long after it had been discontinued? Was the operation then completed? If so, for how long?

18. What efforts were made to restore animation, and how long were they continued?

19. To what immediate cause do you yourself attribute the sudden death of the deceased?—This gives an opportunity to explain about the part which may have been played in the fatality by defective health or by surgical shock, hæmorrhage, asphyxia from vomiting or blood in the air passages, and so forth. In this connexion it may be pointed out that a large proportion of deaths during anæsthesia are not due to simple over-dose, but to some combination of causes, and the anæsthetic sometimes has little or even nothing to do with the fatality. The answer should indicate as briefly as possible *all* the causes—e.g., "failure of a diseased heart in an alcoholic man during excitement caused by anticipation of an operation and by inhalation of anæsthetic." If it arose from some effect of the operation, over which the anæsthetist had little or no control, he should not undertake to give evidence which ought to be given by the operator. There is still in some surgeons a belief that all inconvenient or dangerous reflexes, including operation shock, may be blocked completely by general anæsthetics.

20. In how many cases have you given an anæsthetic previously? If any fatal cases, say how many.—It has often been pointed out that statistics concerning fatalities are of

little value. A man may have been so unfortunate as to have had two deaths in 500 cases, but one may have been that of an infant in a dying state from internal obstruction, and another that of a brewer's drayman with impeded breathing from cellulitis in the neck. It would be extremely unfair to require him to say simply he had had two deaths in 500 cases. It would give a perfectly erroneous notion of his capacity.

The question of consent may also arise, especially when the administration was for any reason risky, and there may be also inquiry as to the quality of the anæsthetic used.

Several of the questions, suggesting carelessness or incompetency, or entailing explanations which would not be understood by the laity, are open to objections. However, any or all of them may possibly be asked of an anæsthetist, and they show that before giving an anæsthetic the anæsthetist should be thoroughly acquainted with the subject, and realise his heavy responsibility, not only as regards the patient, but also as regards the surgeon and himself. The administration should be conducted with the utmost attention, and notes taken, at least in any unusual case, because the anæsthetist may be called upon at some future time to justify his actions. I need hardly add that membership of a medical defence society may in this, as in any kind of practice, prove to be a wise precaution.

THE INTERNAL SECRETION OF THE PANCREAS AND ITS APPLICATION TO THE TREATMENT OF DIABETES MELLITUS.*

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THE association of the pancreas with diabetes mellitus has been known for many years, but it would be beyond the purpose of this paper to refer to all the literature which has accumulated, especially of recent years. The work of Dr. Banting and his co-workers in Toronto has excited world-wide interest, and a brief résumé has appeared in the columns of THE LANCET.[1] They have been working upon the same lines as myself and have apparently met with similar difficulties in the preparation and isolation of the active principle "insulin" in a stable form. They have found their preparation possesses the power of reducing the blood-sugar when given subcutaneously, but is quite inactive by the mouth.

The observations I have made are communicated with the view to calling attention to the mode of preparation I have worked out, and certain observations which appear to be of importance at the present juncture. The fact that this pancreatic preparation is rendered stable, and so capable of oral administration, is undoubtedly of interest, and for this reason as full an account as possible of the mode of preparation is included in the text. The intention was to refrain from publication until more detailed results were available as regards its application in treatment, but it is hoped that such data will soon be available.

The work of Allen in America deserves particular mention, since it supplies very strong evidence in favour of an implication of the pancreas in true diabetes mellitus. My work has been concentrated upon the same problem for over ten years, and in October, 1920, I published a paper dealing with diseases of the pancreas.[2] In this paper it was stated that the results, although giving no definite positive evidence of disturbance of function of the pancreas in diabetes mellitus, yet gave an insight into the possible site of disease. The "tripod" of tests—viz., the Loewi adrenalin mydriasis test, the occurrence of glycosuria, and a high diastase content of the blood and urine—have proved to be remarkably constant in diseases of the pancreas. This association was regarded as of particular importance, since it pointed the way to a possible solution of the problem of the exact function of the pancreas in controlling carbohydrate metabolism. The early appearance of the "tripod" of tests, and their just as rapid disappearance, suggested a sudden disturbance of some chemical mechanism. From all the data available, it was possible to devise a plan of campaign which has been sedulously followed out. This plan was to find out the nature of this chemical mechanism. The internal secretion of the pancreas was isolated by me over two years ago, and has been applied to a fairly large number of cases, some of which are recorded in this paper. The preliminary results were detailed at the annual meeting of the Biochemical Society held at the Lister Institute in 1921.

Data on which the Theory of the Pancreatic Origin of Diabetes Mellitus is Based.

The conviction that the pancreas is the primary seat of the disease has gained ground of recent years. An excellent summary of the present state of our knowledge of this phase of the problem was given by Dr. Graham in his Goulstonian Lectures. In the years 1916, 1917, and 1918, I had an opportunity of studying several hundred cases of glycosuria and mild diabetes mellitus whilst serving in India, and this investigation laid the foundation of all my subsequent work upon this subject. Many of these have proved to be true pancreatic diabetes. A detailed study of such cases revealed the following results:—

1. It is practically confined to those who consume large quantities of fats and carbohydrates—viz., the well-to-do classes (confirmation of McCay).
2. The glycosuria shows hourly variations, being almost negligible in the morning, and gradually increasing towards night.
3. The tolerance to carbohydrates decreases as the day proceeds, and this is well shown by hourly determinations of the blood-sugar. It is also much reduced for two hours after each meal.
4. The glycosuria yielded rapidly to treatment, if all the carbohydrates were consumed before midday, a mode of life which is carried out by the working-class natives, who rarely suffer from glycosuria.
5. Starvation treatment is rarely necessary.
6. Once the tolerance to carbohydrates is restored and the chemical mechanism of control re-established, the blood-sugar remains within normal limits, and the patient is able to return to a normal dietary.

These observations were all in accord with those I had obtained previously in cases of pancreatic glycosuria.

The cases of acute pancreatitis are of particular interest in this connexion, viz., (1) the almost constant occurrence of positive results with the "tripod" of tests; (2) the complete disappearance of these signs, especially the glycosuria, with recovery; and (3) the return of the positive findings with an exacerbation of the disease.

In cases of pancreatic insufficiency and mild diabetes mellitus, the glucose tolerance test [3] has shown two very characteristic features—viz., the slow and continuous rise of blood-sugar up to one hour after the glucose has been consumed, often reaching very high figures, and the rapid disappearance of the sugar from the blood. This suggested the possibility of a dual control by the pancreas. The portal entry of the sugar into the liver, and the systemic outflow from the liver, would appear to be controlled, in part, by the pancreas. In cases of pancreatic insufficiency the control over the storage of glycogen is deficient, as well as the control over the distribution and utilisation of sugar by the tissues. Abundant evidence is obtained from glucose tolerance tests, and these will form the subject of a separate communication. This control would appear to be almost perfect in the early morning, and hence the unlimited tolerance to glucose before breakfast, and the low sugar content of the blood at this time. The liver and tissues are

* My thanks are due to the staff of St. Bartholomew's Hospital for permission to use their cases.

[1] THE LANCET, 1922, August 19th, 398. See also Nov. 18th, 1081, 1086. [2] Mackenzie Wallis: Quart. Jour. Med., 1920, xiv., 57.

[3] Mackenzie Wallis and Bose: Jour. Obst. and Gynæc. of the British Empire, vol. xxix., No. 2, Summer, 1922.

able to pack away glucose when this sugar is absorbed on an empty stomach, and there would thus appear to be an abundance of the internal pancreatic secretion available. When the external secretion is working—viz., 1–2 hours after a meal—the internal secretory activity is damped down. The blood-sugar increases, and normal urinary sugar is also increased, and also the diastase content of the blood and urine. This relationship is so constant as to lead to the conclusion that the two functions of the pancreas cannot work together, but that one works at the expense of the other. This was a fundamental point, and formed the basis of all subsequent work. The pancreas in infants is said to contain large numbers of islands of Langerhans, but, in my experience, these are most prominent in the pancreas of marasmic infants, and those dying from infantile summer diarrhœa.[4] This led me to support the view that the islands of Langerhans developed at the expense of the acinar cells.

The Preparation of an Active Extract of the Pancreas.

The above evidence, which has been confirmed by observations on cases with undoubted pancreatic insufficiency, was made use of in the preparation of the active principle of the islands of Langerhans. It was obviously necessary to obtain the pancreas in such a condition that there was a sufficiency of islet cells, and this was achieved by the use of fresh material. The first problem that arose was to ensure complete destruction of any active ferment, particularly trypsin, since this was found to destroy the active principle. Extraction of the pancreas obtained post mortem had yielded no active constituent, for the simple reason that ferment activity had destroyed the internal secretion. After many fruitless attempts, it was found that heating to 60° C. was sufficient for this purpose. The use of alcohol as an extractive has been proposed for a very long time, and tried by various workers for this purpose, but without success. Other tissues were used for control purposes, and, in this way, an active constituent of the corpus luteum was isolated and described by myself and Dr. H. Everard Williams in THE LANCET.[5] The final product obtained from the pancreas proved to be very unstable; it undergoes decomposition, and is prone to take up moisture. At first, the length of time for extraction had to be determined. Three weeks' extraction yielded a fairly active preparation, but it was soon found that traces of alkali were sufficient to cause destruction. The use of 0·2 per cent. hydrochloric acid was adopted, and this gave an active preparation.

The chief difficulties having been overcome, the final method of procedure was as follows: Fresh pig's pancreas is obtained from the slaughter-house, the pigs having been without food for 24 hours before being killed. The fat and connective tissue are dissected away, and the pancreas cut up into small fragments. The finely divided pancreas tissue is placed in a Jena distillation flask, containing alcohol, and the whole mixture heated up in a water-bath to 60° C. for one hour. The flask is now connected up with a vacuum pump and the process of distillation in vacuo allowed to proceed. The alcohol in the extractive fluid is at first quite clear and colourless, but gradually becomes opalescent. As the extraction proceeds, the mixture slowly darkens in colour, and this is the chief feature of the process.[6] At first I aimed at obtaining a colourless extract, but soon found that this was inactive. When this darkening has appeared, the extraction is complete, the time taken depending on the efficiency of the vacuum employed. A feature of this mode of extraction is that the usual time is about 30 hours, whereas in my other method at least three weeks' extraction was necessary.

Another point of value in the operation is the extraction of the bulk of the fat in a semi-solid form, with the low temperature and the vacuum employed.

When the extraction is complete, the contents of the flask are removed, and filtered through muslin and finally through filter-paper, under reduced pressure. The resulting filtrate is quite clear, and of a golden-brown colour. This filtrate contains the active principle, together with certain lipoids extracted from the pancreas. The extract is now evaporated down in an electric drying oven, maintained at 100° C. The extract first of all thickens and becomes quite gelatinous, and the depth of the brown colour increases. The final product is a brownish hard mass, which can be easily pulverised. The extract is kept in sealed bottles in an ice-box, and not opened except when required for use. The yield from 12 lb. of fresh pancreas is about 70–80 grammes. The brown powder possesses a characteristic odour, and is prone to deliquesce when left exposed to the air, and to undergo decomposition. The powder is very soluble in water, but can be kept in solution in sterile saline. It consists of a polypeptide and associated with it a small amount of lipoidal material. This latter is necessary, since it serves to protect the active principle from decomposition. There are no proteins or peptones in the extract, and no cholesterol. Further, the extract does not give any reactions for histidine, histamine, or cystine. The several batches are tested for soluble proteins, peptones, and cholesterol, and the absence of these substances indicates that the extraction has been properly carried out. The alcoholic extract of this substance produces a definite opalescence in water, and appears to undergo decomposition in consequence. The most remarkable feature is the sensitivity to alkalies, the merest trace being sufficient to produce destruction of the active principle. On the other hand, it is remarkably stable in the presence of 0·2 per cent. hydrochloric acid.

Its action in vitro was determined by means of glycolysis of blood. When incubated with fresh blood, to which a known amount of sugar had been added, the sugar rapidly disappeared. This glycolysis was much more rapid and also more complete when the pancreatic extract was added than when it was absent. There appeared to be evidence that the extract might act as a catalyst under such circumstances, but this did not appear likely, since a definite quantitative relationship was found to exist between the amount of pancreatic extract and the rate of disappearance and completeness of removal of added sugar to blood. The variation of blood glycolysis is well known and consequently very little value was placed upon these observations. The experiments were, however, of interest, since they have been confirmed abundantly in a number of treated cases. The use of rabbits suggested itself, but was given up for the following reason. A large number of laboratory rabbits showed variations in normal blood-sugar from 0·05 to 0·25 g. per cent. The amount of blood-sugar would appear to depend upon the nervous activity of the animal, and the presence of any intercurrent disease. Rabbits which had received an injection of any kind a week previously, often showed a very low blood-sugar. Rabbits did not serve the purpose, and as dogs could not be used, the experimental method of investigation had to be given up. All the extract was prepared in the same way, and tested chemically.

It was then put up in gelatin capsules, in ½ and 1 grain doses, and tried on certain selected cases. The glucose tolerance test provided means for proving whether the extract was capable of exerting any action in vivo. A patient with glycosuria who gave a typical one-hour maximum rise, so characteristic of pancreatic cases, was given 50 g. of glucose and 2 gr. of pancreatic extract by the mouth. The blood-sugar curve was now found to be indistinguisable from the normal curve, and no glycosuria followed. The pancreatic extract was given to patients with a high blood-sugar content without any alteration in the diet. It followed that, if this was the case, it might be possible to increase the patient's tolerance to glucose without unduly raising the blood-sugar. In one case

[4] Vide L.G.B. Report, 1910.
[5] THE LANCET, 1922, i., 784.
[6] If no darkening appears, the probability is that the mixture has become alkaline, and it is then necessary to add 0·2 per cent. acid to the extracting fluid.

where the tolerance was reduced to below 15 g. of carbohydrates per diem, and all attempts to render the patient free from glycosuria had failed, such an attempt was made. By giving pancreatic extract with successive quantities of carbohydrates it was possible in one week to raise the tolerance to just over 100 g.

Cases Illustrating Results of Use of Pancreatic Extract.

The results of a trial of this extract in three cases are recorded below, and it will be seen how it is possible to increase the tolerance to carbohydrates by the use of the pancreatic extract.

CASE 1.—Female, aged 15 years. Under the care of Dr. M. T. W. Steedman. First seen January, 1922, complaining of excessive thirst and appetite. She was also drowsy and had suffered from boils. The onset was acute, and within two weeks she had suffered from boils, cramps in legs, thirst, polyuria, and loss of weight. The blood-sugar was 0·2 g. per cent., and the urine showed a volume of 3700 c.cm.; S.G., 1038; sugar, 7·9 g. per cent.; total, 392·3 g.; acetone bodies present in quantity. After taking the pancreatic extract for one week, the volume of the urine was reduced to 1360 c.cm., the sugar output was 54·5 g., and only traces of acetone bodies were present. The blood-sugar was 0·155 per cent., and this was on a liberal diet containing 50 g. of carbohydrate. The progress of the case from this date, Jan. 13th, 1922, was favourable. The urinary volume was normal, all signs and symptoms disappeared, and the acetone bodies disappeared completely. The urinary sugar gradually fell, and in three weeks had disappeared entirely. The patient's weight remained constant at about 8 stone, and she has been able to take exercise and keep free from all signs and symptoms. While away during Easter she indulged in sweets, &c., and the sugar returned. The glycosuria was controlled by pancreatic extract in a very few weeks. During the summer vacation she indulged in large amounts of fruits and sweets, and in consequence the glycosuria again returned. The pancreatic extract has been given in increasing dosage, but it has taken a much longer time to reduce the glycosuria. The patient has been allowed carbohydrates in the form of toast, &c., for breakfast and lunch but has not taken any carbohydrates at night. In spite of the return of glycosuria on two occasions, she has not complained of any thirst or polyuria, and says that she feels quite fit as long as she is taking the pancreatic extract.

CASE 2.—Female, aged 35. Indian subject, suffering from mild diabetes mellitus. In 1919 the blood-sugar was 0·18 g. per cent., with slight glycosuria. In 1920 the blood-sugar was, on the average, 0·20 g. per cent. On a fairly strict diet she remained practically sugar-free, but the least indiscretion brought back the glycosuria. The tolerance to 25 g. of glucose was good, in spite of the marked hyperglycæmia which occurred. The blood-sugar before the test commenced showed 0·26 g. per cent. In a quarter of an hour it had reached to 0·27 in half an hour to 0·279, and in one hour to 0·315 g. per cent. In 1½ hours the blood-sugar fell to 0·27 g. per cent., and in two hours to 0·22 g. per cent. No glycosuria followed. This patient was given pancreatic extract in June, 1921, and was able to live in a London hotel and consume all kinds of food. She however avoided sugar and sweets. On returning to India she was able to take the pancreatic extract for a short time. Since then she has remained sugar-free, and this year had a short course of pancreatic extract, with the result that her blood-sugar was reduced to normal limits. The patient presents many features of interest, and the result so far has been satisfactory after the two courses of treatment extending over a period of two years.

CASE 3.—Female, aged 17. Under the care of Dr. Langdon Brown. Previous to this time she had been treated by alimentary rest and other dietetic measures but without complete success as far as the glycosuria was concerned. The blood-sugar was 0·16 g. per cent., and there was definite glycosuria after 50 g. of glucose. She presented signs of true diabetes mellitus, and gave a family history of this condition. On the pancreatic extract the acetone bodies rapidly disappeared, as also the glycosuria. The patient continued the treatment for four months and remained sugar-free. Her daily allowance of bread during this time was 4½ to 5 oz. In view of the improvement in her general health, and the fact that she had been sugar-free for some time, the pancreatic treatment was stopped. Up to the present there has been no return of the glycosuria, and the patient's general condition remains satisfactory.

A number of cases have been treated in St. Bartholomew's Hospital, and the diet, blood-sugar, &c., carefully controlled. Some of these patients are still under treatment. Taking cases of glycosuria in various decades, it has been found that cases between the ages of 10 and 20 do best with this pancreatic treatment. This is of particular interest, as hitherto the prognosis of glycosuria occurring at this age-period has been regarded as distinctly unfavourable.

Discussion of Treatment.

A general plan of treatment was worked out, and consisted in placing the patient on a diet containing a limited amount of carbohydrate, and gradually building this up with the aid of the pancreatic extract. In this way the amount of fat in the diet can be kept down and added last of all, when the patient is free from acetone bodies. The first change that occurs when the pancreatic extract is given by mouth on the controlled diet is the disappearance of thirst and consequent reduction of the polyuria. In about a week the acetone bodies are much reduced or completely abolished. The glycosuria persists for a much longer period but is often in such small quantity as to be regarded as negligible. A number of cases of glycosuria treated in this way have shown no response at all, and so the pancreatic treatment has been discarded. The proportion of cases of true diabetes mellitus amongst cases of glycosuria is very small indeed, and the treatment in its present form is therefore limited. In cases of glycosuria presenting complications—e.g., gangrene—the treatment proved a useful adjunct in reducing the blood-sugar and so rendering surgical measures more successful. Four cases of diabetic gangrene have been treated in this way. The chief value of the pancreatic extract appears to be to tide such cases over crises to which they seem prone to succumb and to enable their tolerance to be raised.

The general condition of the patient, the amount of the blood-sugar, and the degree of tolerance to carbohydrates are the determining factors in treatment. If the case is severe, as much as 6 gr. of pancreatic extract are given daily, and if this does not succeed the amount may be increased to 10 gr. As a general rule, 3 gr. usually suffices for most cases. The duration of the treatment likewise depends on the response and the amenability of the patient. The craving for sugar and the restraint put upon patients make treatment a matter of considerable difficulty. Most of the patients have been treated from 6–12 months, but the treatment has been perhaps unduly prolonged in some cases, owing to difficulty in obtaining sufficient pancreatic extract.

The extract has been given intravenously in one case of diabetic coma, and the patient lived for four days. In no case has any harmful effect followed the treatment; no doubt this is due to the same reason which has prevented the trial of large doses—i.e., lack of material. The danger lies in the patient, who, when he feels quite fit and knows that he is free from sugar, is apt to indulge too freely in carbohydrates, with the result that his tolerance is reduced to a low level. The treatment has then to be recommenced. During the past few years my time has been occupied in picking out cases suitable for treatment, and this has involved the use of glucose tolerance tests. In many cases the glycosuria is best left alone; in others, where complications have supervened, a short course of pancreatic extract treatment is advisable and may help. In others, again, after a trial of a few weeks, the pancreatic extract appears to have no effect, and is, therefore, discarded. If the treatment is to become universal, the question of supply is an important matter, and we do not know how long the treatment must be continued or the correct dosage for each individual case. It is, of course, essential to control the preparation, as it is obvious that its manufacture is beset with untold difficulties.

It will be seen that I have concentrated my attention on the pathological side of the problem, since a study of the diseases of the pancreas tended to throw a flood of light on an otherwise obscure subject. If one meets with cases of acute pancreatitis with fleeting glycosuria and other evidence of a disturbance of the internal secretion of the pancreas, the combination excites interest. Again, after seeing a pancreas at operation which, to the naked eye, is practically

destroyed by acute inflammation, and which two years later has completely recovered, one is again struck by this power of the pancreas to regenerate. Is it possible that, by giving the pancreatic extract by the mouth we are enabled to rest the pancreas, and so enable it to recover its lost function? That this is so with the external secretion has been shown in many cases of pancreatitis, and it is reasonable to assume that the same applies to the internal secretion. The problem that confronts us is the exact nature of the active constituent, its mode of action, and last, but by no means least, its preparation synthetically.

Conclusions.

1. A preparation of the pancreas obtained by alcoholic extraction in vacuo has been made.
2. This extract, when given by the mouth, is capable of reducing the blood-sugar in certain cases of diabetes mellitus.
3. By reducing the blood-sugar it is possible to increase the patient's tolerance to carbohydrates.
4. The pancreatic extract is therefore useful as an adjuvant in treatment, particularly in cases of diabetes mellitus with complications—e.g., gangrene, threatened coma, &c.
5. The duration of treatment as well as the actual dosage is determined by the general condition of the patient, the blood-sugar, and the actual tolerance to carbohydrates.

A NOTE ON THE MECHANICAL TREATMENT OF SEVERE DROPSY.

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RECENT experience in reading the papers of candidates in some of the final examinations in medicine has given me the impression that the simplest and most effective method of treating severe dropsy—either cardiac or renal in origin—which does not improve under the administration of the usual drugs, heart tonics, aperients, &c., is not taught or practised to any large extent in the medical schools. The great majority of the candidates advise the insertion of Southey's tubes into the swollen feet or legs. Undoubtedly in this way large quantities of fluid may be drained off, but the tubes inevitably cause a certain amount of irritation in the œdematous, badly nourished tissues, so that sooner or later inflammatory changes are set up around them and the discharge of fluid gradually ceases. A far simpler and usually also more efficient method is merely to puncture the feet with a surgical needle. The punctures should be made where the swelling is most marked, usually over the dorsum and the malleoli, five or six close together in each situation. From such punctures fluid will often flow steadily and continuously for several days, and if, as not uncommonly happens, they close before the dropsy has disappeared fresh punctures may at any time be made in adjacent areas. There is not the slightest need for actual incisions into the subcutaneous tissues, such as are sometimes made. The latter may drain well for a short time, but they soon get blocked by inflammatory change and remain as troublesome, slowly healing wounds, very liable to become septic. Before puncturing it is advisable to get the patient out of bed into a chair for a few hours, so that the feet become the most dependent parts and the œdema fluid is able to gravitate down into them. The relief afforded by puncture is then more rapid. If possible the patient should remain in the chair whilst the drainage continues. This is not difficult, at any rate, in cases of cardiac dropsy, for patients with advanced heart failure are often far more comfortable and sleep better in a well-arranged arm-chair than in bed. Should ascites be present also, the drainage of the feet first relieves this, and then the œdema gradually diminishes from the top of the thighs downwards. Paracentesis of the abdomen is rarely necessary.

Method of Puncture.

Before making the punctures the skin of the feet should be cleaned as for a surgical operation, being first washed with hot soap and water, then rubbed with ether, and finally painted over with a 2 per cent. solution of iodine. The punctures should be made with a large, straight surgical needle and afterwards covered with sterile gauze and sterile wool, changed as often as may be necessary. The feet may be supported on wooden blocks placed in a large basin into which the œdema fluid escapes.

In cases of renal dropsy it is always desirable to avoid any form of mechanical treatment if possible, for although great immediate relief may be obtained, yet, no matter what precautions are taken, the wounds are likely to become infected, a spreading inflammation is set up in the skin and subcutaneous tissues, and a fatal termination soon follows—an example of the general rule that in cases where the excretory function of the kidneys is much impaired the resistance of the tissues to bacterial invasion is greatly diminished. Nevertheless if, as sometimes happens, true renal dropsy is so extreme and so entirely unresponsive to other forms of treatment that something further has to be done to avoid ulceration or spontaneous rupture of the distended skin, the simplest and safest procedure is undoubtedly the needle puncture, as the injury to the tissues, the size of the wounds inflicted, and the mental disturbance of the patient are thus reduced to a minimum. With cardiac dropsy the risks of surgical interference are very much less.

An Example of the Value of the Method.

The following is a typical example of the value of this method of treatment in a severe case of cardiac dropsy.

History.—A male, aged 31, a lift attendant, was admitted to the Royal Free Hospital, London, on Jan. 11th, 1922, suffering from double mitral disease, due to rheumatism in childhood. He had been in the hospital two years before, for about two months, for dilated, failing heart, but at that time there was hardly any œdema. He had improved very much under treatment and remained fairly well until November, 1921, when he became increasingly breathless and had to stay in bed.

Condition on Examination.—On admission the patient could not lie down; the heart's apex beat was in the sixth space outside the nipple line, and the dullness extended from the middle line to about 1½ inches outside the nipple line. The heart's action was rapid—100 to 120— and somewhat irregular; auricular fibrillation was undoubtedly present. There was considerable congestion of the pulmonary bases and the liver reached about 2 inches below the ribs, but there was no albuminuria and only slight œdema of the feet.

Treatment.—The patient was extremely intolerant of digitalis; it was given successively in the form of the tincture in 15-minim doses, of the powdered leaves one grain with squill and blue pill, and in Nativelle's granules of digitalin, gr. 1/240 twice daily. In every case it caused vomiting after a few days without giving rise to any improvement in the cardiac condition. In the meantime the heart became more dilated, the congestion of the lungs increased, the liver became larger, and the legs extremely œdematous. The quantity of urine diminished, often to between 20 and 30 oz. per diem, and it contained albumin. Theocin sodium acetate, given as a diuretic in three-grain doses, temporarily raised the quantity of urine to between 50 and 60 oz., but the increase was not maintained. Six leeches were applied over the liver, and subsequently nearly half a pint of blood was withdrawn from the arm with only transient benefit.

Puncture and Recovery.—As the man was steadily getting worse, on Feb. 9th he was made to sit up in a chair, and on the following day his feet, now enormously swollen, were punctured with a large surgical needle. Fluid began at once to drain away freely; after a few days, however, the discharge almost ceased and fresh punctures were made chiefly over the dorsum of the feet. This was continued for about five weeks, and during the whole of this time the punctures never gave the slightest trouble. About 26 pints of fluid were actually measured as having escaped from the feet, besides a large quantity soaked up by the absorbent wool in which they were wrapped, and which it was quite impossible to measure or even to estimate. The swelling of the legs slowly but steadily diminished, the quantity of urine increased

to about 80 oz. a day and occasionally considerably more, the heart's action became stronger and slower, with a coincident diminution in the area of dullness, and by the beginning of April the œdema had disappeared completely. The patient remained in the chair for fully five weeks, without once returning to bed, until the dropsy had almost cleared up. He was able to tolerate a mixture of tincture of digitalis and tincture of strophanthus, five minims of each three times a day, and took this for many weeks. Probably it contributed materially to his recovery, but the great improvement certainly started from the time that satisfactory drainage from the feet was established, as this doubtless diminished the strain upon the heart. He left hospital on May 18th and was then able to walk about comfortably; there was no œdema, the urine amounted to 60 or 70 oz. a day and was free from albumin, the pulse-rate was about 70 and slightly irregular, the lungs clear, and the liver only an inch below the costal margin.

Nearly every night for over two months the man had from $\frac{1}{6}$ to $\frac{1}{4}$ of a grain of morphine with 1/100th of a grain of atropine subcutaneously. I mention this to emphasise the important fact that one of the essentials in the treatment of cases of advanced cardiac failure is to secure good sleep for the patient. In the zest with which we push digitalis or strophanthus we are in danger perhaps of overlooking the fact that, valuable as these are in cases of heart failure and pre-eminently in auricular fibrillation, sleep may be an even more valuable heart tonic, especially as insomnia is commonly one of the most constant, distressing, and exhausting results of serious heart disease. Simple hypnotics—bromides, paraldehyde, chloral, &c.—may first be tried, but should they fail, and in really bad cases they are only too likely to fail, no time should be lost in giving morphine subcutaneously and in adequate doses. As a rule nothing but good comes from its administration, and the contra-indications to its use are few indeed. It may be given safely (preferably with atropine) even when there is much œdema of the lungs, for in most cases this depends mainly or entirely upon the heart weakness, and if morphine procures refreshing sleep it will make the heart stronger and so directly improve the lung condition. The same applies to albuminuria, unless there is good reason to think that the heart failure is due altogether to a primary renal disease. In those cases where a man is so ill that if he does not get sleep he will almost certainly die soon from exhaustion, and if he is given enough morphine to procure sleep a fatal asphyxia is likely to supervene, his chances of improvement under any circumstances are probably nil. If the patient gets better the morphine can be reduced slowly and finally discontinued altogether with but little trouble. In the present patient this was done early in April, after the disappearance of the dropsy; towards the end he was given injections of sterile water, whilst he was under the impression that the morphine was still being continued.

THE USES OF POISSON'S FORMULA.

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IN a note under the heading The Systematic Use of Poisson's Formula, published in a previous number of THE LANCET,[1] I urged the need of applying some arithmetical test of the concordance, or lack of concordance, between the findings in series of cases before any conclusion was drawn as to the material significance of any difference in the findings. For this purpose, I used a formula, called Poisson's rule, which has figured in many text-books of public health, and I suggested that this formula should be applied to series of observations in order to determine whether the variations obtained in different series were due to chance or to some real difference in the materials under observation. I stated that if, in one series of observations a certain result were obtained, it would be possible by the application of Poisson's formula to predict the limits within which the results of a second series of similar observations would probably lie were the second sample taken from the same population as the first.

[1] Rudolf, G. de M.: THE LANCET, 1922, i., 1146–7.

Poisson's Intention.

I had not, at the time of writing, the opportunity of consulting Poisson's own treatise, written in 1837 (unfortunately the writers of medical text-books seldom give references) and Dr. M. Greenwood has very kindly pointed out to me that Poisson did not design this rule for the purpose to which it has been applied. The rule was, in fact, proposed as a measure of the probability that if in M trials, M being a very large number, m successes and n failures have been observed, the "true" probability of occurrence of successes will fall within certain limits on either side of $\frac{m}{M}$. The somewhat similar expression also given by Poisson should, he pointed out, only be used to predict the probable limits of occurrence in a *second* series of N trials, if N, while absolutely large, was, relatively to M, small.[2] Poisson's formula states that the limits, within which the odds are large that the probability of occurrence will fall, lie between

$$\frac{m}{M}+2\sqrt{\frac{2\,mn}{M^3}} \text{ and } \frac{m}{M}-2\sqrt{\frac{2\,mn}{M^3}}, \text{ or } 100\left(2\sqrt{\frac{2\,mn}{M^3}}\right)$$

if percentages are being adopted.

I suggested, as explained in detail in my former article, that when graphs of statistics were plotted, Poisson's formula should be applied to each chart: the two probable limits found by the formula should then be plotted one above, and the other below, the curve of the observations. Thus, one could tell at a glance the value of the observations by noting the width of the bar, as I proposed to term the area between the two curves of the probable limits of occurrence, for the narrower the bar the more nearly do the results approach those which would be obtained if an infinite number of observations could be made.

Other Methods of Examining Statistics.

There are, however, other methods of examining statistics. When we are given a single set of M trials and wish to predict the probable composition of a second sample, the usual plan is to compare $\frac{m}{M}$ times N with the square root of—

$$N\left(1+\frac{N}{M}\right)\frac{m\,(M-m)}{M^2}, \text{ or, if the formula be expressed as a percentage,}$$

$$\frac{100\,m}{M}\,N \text{ with } 100\sqrt{\left(\frac{1}{N}+\frac{1}{M}\right)\left(\frac{m}{M}\times\frac{M-m}{M}\right)},$$

which agrees with Poisson's formula (omitting an outside factor which only concerns the degree of improbability) when M=N. But, as remarked, few statisticians would regard the application as justifiable when M and N are of the same size.[3] All these tests are of value when the question is one of forecasting, for use before the second trial, and naturally of some interest in determining what order of importance is likely to attach to a second sample of a certain size.

When we have two or more samples actually given us, the most useful test is based upon the following argument. Suppose there are m samples and that n_1, $n_2 \ldots n_m$ are fractions of m, n_1 giving p_1 "successes," n_2 giving p_2 "successes" ... n_m giving p_m "successes." What is the probability that they are samples of the same "universe" or conditions investigated? We do not know what universe is in question really, but our best approximation is to test whether the samples might consistently come from a "universe" in which the "true" chance of success is measured by the ratio of $(p_1+p_2+\ldots p_m)$ to $(n_1+n_2\ldots n_m)=\frac{P}{N}$, where P is the total number of successes and N the total number of series of observations. On that supposition, we shall expect in n_m trials, $\frac{n_m P}{N}$

[2] Poisson, S. D.: Recherches sur la probabilité des jugements. Paris, 1837, pp. 209-10.
[3] Pearson, Karl: Philosophical Magazine, 1907, p. 365.

successes and we can perform a test in the manner set out in the following arithmetical example, the material for which was extracted from Dr. Aldren Turner's treatise on epilepsy.[4]

An Arithmetical Example.

The example is, however, of arithmetical interest only, for, as Dr. Aldren Turner points out, some of the authors named in the table "have included in their statistics nervous maladies, which do not stand in any direct causal or hereditary relationship, such as apoplexy, neuralgia, locomotor ataxy, and general paralysis of the insane," and—as he goes on to say—this factor might be the cause of the discrepancies in the results of the work of the various observers.

Table of Cases of Epilepsy Stated to Have Hereditary Histories by Various Authors.

No. of cases.	Hereditary history.		Standard error.	Difference between cols. 2 and 3, divided by col. 4.	Author.
	Number observed.	Expected number.			
1	*2*	*3*	*4*	*5*	*6*
306	77	130·3	8·649	+6·16	Echeverria.
38	12	16·2	3·048	+1·38	R. Reynolds.
364	116	155·0	9·434	+4·13	Moreau.
508	163	216·3	11·144	+4·78	Aronsohn.
71	23	30·2	4·166	+1·73	O. Berger.
150	54	63·9	6·056	+1·63	Binswanger.
2400	960	1021·7	24·223	+2·55	Gowers.
1070	599	455·5	16·174	−8·87	Spratling.
350	234	149·0	9·250	−9·18	Déjérine.
5257	2238	2238·1			

In the table col. 1 records the number of cases of "epilepsy" reported by the author whose name appears in the last column. Col. 2 is the number of cases in which a "hereditary" factor was alleged to exist. Let the problem be to determine whether these fluctuations could have arisen by the play of chance, the series being random samples (i.e., samples taken at random) from a universe wherein the proportion of "hereditary" cases is taken to be the ratio of such cases to the total number observed in the complete series of nine sets. Col. 3 gives the numbers expected on that hypothesis, obtained by dividing the total number of cases with a hereditary history in the nine sets by the total number of cases examined and multiplying this factor by the total number of cases observed in each series in turn. Thus the expected number of cases with a hereditary history in the first set of 306 cases is $306 \times \frac{2238}{5257} = 130{\cdot}3$. Col. 4 is the "standard error of sampling" of the expected number, and is obtained by taking the square root of n p q, where n is the number of trials, p the chance of success, and q equal to $1-p$, the chance of failing. Thus, take the first line; in the 306 cases reported by Echeverria, 77 were said to have a hereditary taint; had the proportion been the same as in the whole series of nine sets, instead of 77 there should have been 130·3 cases with a standard error of $\sqrt{306 \times 0{\cdot}42571 \times 0{\cdot}57429}$, which is about 8·65, where $0{\cdot}42571 = p = \frac{2238}{5257}$.

Improbability of "Freak" Deviations.

Evidently the significance of differences between observation and calculation depends on the relative magnitudes of deviation and standard error of expectation. In col. 5 differences are reduced to terms of the appropriate standard errors by dividing the former by the latter.

A mere glance at this table is sufficient to satisfy one that the probability of such deviations occurring by a mere freak of random sampling is very small. Not to speak of the uneven distribution of signs (7 positive to 2 negative), five of the deviations between the observed and the expected exceed in magnitude four times the standard error. Now, by the normal curve of error, which was of course the basis of all calculations in the time of Poisson, the chance of a deviation exceeding four times the standard deviation or error, in either direction, is less than 1 in 10,000. The chance that in nine trials a positive deviation of this magnitude should occur in five is extremely minute. When the discrepancy between observed and calculated values is less wide, mere inspection of the system of differences is not enough. It is necessary to employ some test of goodness of fit. A discussion of this is, however, beyond the limits of the present note; reference should be made to such a book as Mr. Udny Yule's "Introduction to the Theory of Statistics" (Griffin).

When we have only two samples to compare, or when it is reasonable to make a division into two groups, there is no difficulty. For instance, suppose we take the data of Eastwood and Griffith quoted in my former note.[1] In 261 cases of human tuberculosis there were 55 bovine infections. Dividing into cases up to 10 years old and over 10 years old, the former showed 155 cases with 45 (29 per cent.) bovine infections, the latter 106 cases with 10 (9·4 per cent.) bovine infections. Might this difference have arisen by chance? Here we need only compare the difference between the two percentages and 100 times $\sqrt{\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}$ (pq) where n_1 and n_2 are the numbers in the two samples, p the proportion of "successes," in this case bovine infections, in the combined samples, and $q = 1-p$. We compare $29{\cdot}0 - 9{\cdot}4$ with $100\sqrt{\left(\frac{1}{106}+\frac{1}{155}\right)} \times 0{\cdot}2107 \times 0{\cdot}7893$, i.e., 19·6 with 5·14. The ratio of the difference to the standard error is 3·8 to 1, giving odds of more than 9999 to 1 against such a difference arising by sampling a population in which the true chance of a bovine infection is $\frac{55}{261}$ or 0·2107.

This rule is a sufficiently accurate test provided (1) the samples are fairly large, (2) the character studied is not a very rare one—i.e., occurs in a fairly large percentage of instances. It cannot be trusted for very small samples or when the character studied is an extremely rare one; for instance, if it does not occur in more than 5 to 10 per cent. of the cases. It is, of course, quite unreliable when "successes" are not independent—i.e., when scoring one success makes it more likely to score a second in the same sample, as, for instance, in the occurrence of infectious fevers, when the presence of each additional case makes the likelihood of other cases occurring greater. In such a case the reasoning upon which the formula was based is inapplicable. In the instances I have given this objection does not apply.

Summary.

The object of these notes is to urge medical writers to apply some numerical test of significance to their results. It is not enough to state that such or such an attribute has been found in such or such a percentage of cases. Some criterion of the purely numerical reliability of this percentage is needed. The plotting of a curve on either side of the observed value, using Poisson's rule as proposed in my first note, would, I think, be a good method, because a glance at the diagram would tell the reader what significance attached to the observed result from the qualitative aspect. I do not, of course, mean that *any* arithmetical test can determine finally the value of a set of data. A hundred careful measurements are more valuable than a thousand careless ones; but, however carefully the hundred observations are made, they are only a sample and are subject to the fluctuations of sampling which it is the aim of such rules as that of Poisson to measure approximately.

In conclusion, I must express my sincere thanks to Dr. Greenwood for his invaluable advice and the great trouble he has taken in assisting me with the preparation of this article.

[4] Turner, W. Aldren: Epilepsy, 1907, p. 25.

THE SUCCESSION OF DOMINANT SPECIES IN A MIXED BACTERIAL CULTURE IN A FLUID MEDIUM.

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DURING the period 1916 to 1918 one of us (W. W. C. T.) had occasion to examine numerous specimens of fæces obtained from men invalided from the Western front suffering from pyrexia of unknown origin. In some cases broth cultures obtained direct from the fæces were incubated over considerable periods, and plate cultivations were made from these at varying intervals of time. The results obtained seemed to warrant a more detailed study when opportunity occurred, and during the past year we have carried out a number of experiments along similar lines. It was our intention more fully to investigate the factors concerned, and to test the applicability of methods, based on the results obtained, to the analysis of the bacterial flora of the intestine. Circumstances have, however, rendered it impossible for us to continue the investigation at the present time. For this reason we are publishing this brief summary of the results so far recorded.

Technique.

The technique employed has been extremely simple. A loopful of fæces has been inoculated into a tube containing 10 c.cm. of broth. Plate cultivations have been made on MacConkey's lactose-bile salt medium after 24 hours' incubation at 37° C., and thereafter twice weekly up to about the sixtieth day, followed by weekly subculture in those cases which have been examined over a longer period. The broth cultures have been maintained throughout at 37° C., and subcultivation on to plates has been continued until no growth occurred, or until the bacillary colonies were entirely replaced by colonies of the *Enterococcus*, a termination recorded in a large proportion of our experiments. Twenty-six specimens from hospital patients and six specimens from mice have been examined in this way. One culture yielded no growth on MacConkey's medium after the fourteenth day. Several gave negative results after a few weeks. The majority first failed to give bacillary colonies at some time between the fiftieth and seventieth day, while the longest period during which such colonies were obtained on the plate subcultures was 98 days.

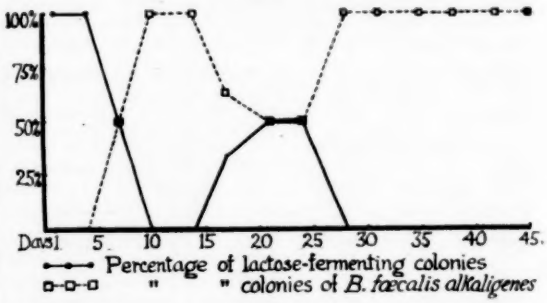
The plates were examined after 24 hours' incubation. The proportion of colonies which had fermented lactose was recorded approximately, and if non-lactose-fermenting colonies were present six of these were subcultured into tubes of peptone water containing lactose and an indicator, and furnished with Durham's fermentation tubes. If late fermentation of lactose occurred the colonies were included as "lactose fermenters." From those lactose tubes in which no change occurred after several days' subcultures were made into media containing dextrose, mannite, and saccharose, and into litmus milk. The bacilli were provisionally identified by noting the production of acid and gas from these "sugars," and the change in litmus milk. Where necessary, other fermentation tests were employed, supplemented in some cases by agglutination reactions.

As regards the condition of the patients from whom these specimens were obtained, all but two of the human cases were purposely chosen as affording no evidence of intestinal disease. One case was provisionally diagnosed as duodenal ulcer and had a history of recent pyrexia; while the remaining patient had a rib abscess from which *B. paratyphosus* A was isolated, but had no recent history of intestinal disturbance. From neither of these latter cases was any non-lactose-fermenting organism isolated. The six mice from which specimens were obtained had recently passed through an epidemic of mouse-typhoid.

Results.

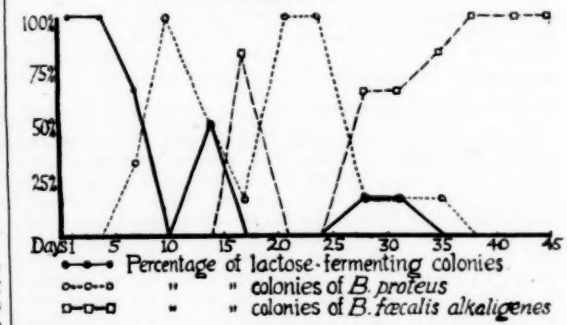
It is not necessary to record the results in detail. In 10 of the 27 cases none but lactose-fermenting bacilli were obtained. In four cases a small proportion of non-lactose-fermenters were present from the start.

CHART 1.



In 12 cases colonies of this type appeared on the plates between the fourth and tenth day. In one case their first appearance was recorded on the twenty-first day. In all cases in which such colonies appeared their relative increase was accompanied by a rapid decrease of the lactose-fermenters, and colonies of the latter type were usually entirely replaced by non-lactose-fermenters within 10 to 21 days. In many cases the lactose-fermenting bacilli were replaced by a single non-lactose-fermenting species, which then persisted throughout the entire experiment. In others, this second species was, in its turn, replaced by a third. While, however, it has been relatively infrequent for lactose-fermenting types to reappear after they have once been replaced, it has often happened that two or more non-lactose-fermenting species have persisted, in fluctuating proportions, over weeks or months.

CHART 2.


100%
75%
50%
25%
Days 1 5 10 15 20 25 30 35 40 45
Percentage of lactose-fermenting colonies
" " colonies of B. proteus
" " colonies of B. fæcalis alkaligenes

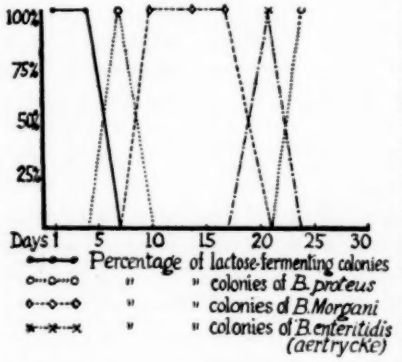
The association of *B. proteus* and *B. morgani* has, for instance, been frequent; and one of these two species has often replaced the other, and again been replaced by it after a time. As regards the human cases, the non-lactose-fermenting species isolated have been *B. proteus*, *B. morgani*, and *B. fæcalis alkaligenes*. From the mouse specimens *B. proteus*, *B. morgani*, and *B. enteritidis* (aertrycke) have been isolated.

Charts 1 to 3 indicate sufficiently the results which may be obtained. The percentages recorded are, of course, only a rough approximation to truth, since they are calculated for six colonies only. They serve, however, to record the general course of events. The whole course of the experiments is not recorded, but no significant change occurred after the termination of the periods covered by the charts.

In other experiments mixed cultures were prepared by inoculating a large tube of broth with one loopful

of a 24 hours' agar culture of each of several strains belonging to the coli-typhoid group. The subsequent procedure was identical with that already described, except that 20 colonies were picked from the plate subcultures during the first 17 days of the experiment, and 10 colonies from each plate subculture between the seventeenth and eightieth days; after which the growth became very scanty and five colonies only were subcultured. The following strains were employed for preparing the original mixed cultures: *B. coli* (neapolitanus type), *B. proteus*, *B. morgani*, *B. typhosus*, *B. paratyphosus* A, *B. paratyphosus* B, *B. dysenteriæ* (Shiga), and *B. dysenteriæ* (Flexner). In one such experiment it was noted that *B. typhosus*, *B. paratyphosus* A, *B. dysenteriæ* (Shiga), and *B. dysenteriæ* (Flexner) never appeared on the plate subcultures. These findings, together with the predominance of *B. proteus* throughout, and the sudden appearance of *B. coli* in pure culture on the thirteenth day, followed by its complete disappearance within a week, were closely paralleled in a second experiment, carried out on identical lines

CHART 3.



In this experiment, however, a single colony of *B. typhosus* was found on the first plate, inoculated on the same day on which the mixed culture was prepared.

In preliminary experiments, designed to throw some light on the factors which bring about this succession of dominant species in a mixed bacterial culture, filtrates were prepared from broth cultures of all the strains dealt with in the experiments last referred to, and also from *B. fæcalis alkaligenes*. The results so far obtained are too incomplete to be worth recording, but it may be stated that certain filtrates exhibit marked selective powers, favouring or inhibiting the growth of certain members of a mixed bacterial culture; so that there is some indication that a technique developed along these lines may enable us to demonstrate the presence amongst a mixed bacterial flora of certain organisms that would not otherwise be isolated.

It is clear that the problem is very complex and that it is intimately related to phenomena which have recently engaged the attention of many investigators. We feel, however, that our results are so incomplete that no useful purpose would be served at the present time by a discussion of the literature. It seems better briefly to record the actual observations we have made, and to leave any attempt at explanation for a future occasion.

Summary.

If a mixed bacterial culture in a fluid medium—in the case under consideration a broth culture of human or animal fæces—be studied by repeated subcultivation on to plates of a suitable medium at definite intervals of time, it will be found that the dominant species, as judged by the relative number of bacterial colonies developing on the medium employed, varies in a more or less orderly manner, one species replacing another and, in its turn, being replaced by a third. By taking advantage of this succession of dominant species it is possible to isolate particular organisms from a fluid culture in which a highly complex bacterial flora is developing.

We wish to record our indebtedness to Dr. A. B. Rosher for his assistance during part of this investigation.

OBSERVATIONS ON CANINE FÆCES ON LONDON PAVEMENTS:

BACTERIOLOGICAL, HELMINTHOLOGICAL, AND PROTOZOOLOGICAL.

BY H. C. BROWN, C.I.E., M.B., B.CH. CAMB.,
MAJOR, I.M.S. (RET.);
AND
G. E. F. STAMMERS, O.B.E., M.R.C.S. ENG.,
LIEUT.-COLONEL, R.A.M.C. (RET.).

With an Introductory Note by
ANDREW BALFOUR, C.B., C.M.G., M.D. EDIN.

(*From the Wellcome Bureau of Scientific Research.*)

INTRODUCTORY NOTE.

THE introduction of motor traffic has not been without its influence on hygiene. Indeed, quite an interesting paper might be compiled showing how it has affected the health of the community, and doubtless proof could be advanced to demonstrate its results, both beneficial and detrimental. Naturally its influence is more apparent in cities, and perhaps most of all in such populous and congested areas as that covered by the stones, bricks, and mortar of London. Here, however, we are concerned only with a side issue, resulting from the coming of the automobile. The dog, in the days of horse traffic, was wont in large measure to obey the calls of nature in the centre of the roadway, as far as possible from the bustling crowd. The animal could do so with comparative impunity, for even the hansom cab was at the best slow-moving and easily evaded. The advent of the motor car, however, put a different complexion on matters, and as the result of sad experience our canine friends found it advisable, for purposes of comfort and safety, to resort to the side-walk. Evidence of this migration is only too apparent and would appear to possess some hygienic significance, for there is now, undoubtedly, a greater risk of the citizen's foot-gear becoming contaminated by malodorous excreta, and also a greater liability to the fouling of children's toys. Disagreeable excrement may thus be more frequently carried into houses than has been the case heretofore. It is interesting to note that, as Dudfield[1] has recently pointed out, the replacement of horses by motor traffic has very greatly diminished the quantity of horse manure lying about the streets, and there is some reason to believe that this change has played a part in lessening the incidence of infantile diarrhœa.

The case of dog excrement is somewhat different. For one thing, the fly does not breed readily in canine fæces. For another, the species of fly visiting and feeding on deposits of the latter is not, as a rule, that which also frequents houses and contaminates food material. Again, in size and consistence the excrement of dogs differs markedly from that of horses, and it is much less likely to be resolved into a fine dust and wafted by the wind into dwellings. At the same time, with our existing knowledge, the fresh opportunities afforded for possible infection from dogs' excreta cannot be viewed with indifference. I say "with our existing knowledge" advisedly, for, strange to relate, little if anything seems to have been done to determine what dangers, if any, may lurk in dogs' fæces. The animal is, of course, known to suffer from certain helminthic infections which can be transmitted to man, but, if we except the work of Dold and Fischer[2] on a bacillary dysentery of dogs occurring in Shanghai, we have been ignorant of what

[1] Discussion: Proceedings of the Royal Society of Medicine, vol. xv., No. 10. Section of Epidemiology and State Medicine, p. 55. Brownlee, John, and Young, Matthew (8/1922): The Epidemiology of Summer Diarrhœa.

[2] Dold, Hermann, and Fischer, Walter (1/11/1920): Ein Fall von natürlich erworbener, bazillärer Dysenterie beim Hunde (mit gleichzeitiger Schistosomiasis, Ankylostomiasis und Filariasis). Centralblatt für Bakteriologie, &c., I.Abt. Originale. Vol. lxxxv., No. 3, p. 198.

may be called its bacteriological potentialities for evil, while, apart from the question of amœbic dysentery, attention has not been seriously directed to whatever rôle its excrement may play in transmitting protozoal infections. Indeed, the only systematic research of any importance to which I have reference is a paper by Meyer Wigdor,[3] describing work carried out through the Bureau of Animal Industry, Washington, D.C. It includes a mention of a paper by Foster on examination of the fæces of sheep-dogs for evidences of parasitism. All this work, so far as I am aware, is limited to a description of the various intestinal helminths found in dogs, and approaches the subject from a different standpoint to that above indicated.

Accordingly it was considered desirable to undertake some research work on the subject, Major Brown being entrusted with the bacteriological investigation, and Lieut.-Colonel Stammers with the microscopic search for the ova of helminths and the intestinal protozoa. These two observers here record their results, and a perusal of their papers will show that, in all probability, the presence of dog excrement in considerable quantities on London pavements—for in some quiet streets and in certain thoroughfares it is much in evidence—need not be regarded as disquieting from the point of view of the public health.

It was of importance that the question should be settled, but quite apart from this aspect of the case, benefit may accrue by directing attention to the need for a greater degree of sanitary cleanliness, even if the necessity for such purification rests merely or at least mainly on æsthetic grounds. During the course of the inquiry there appeared in THE LANCET a useful paper by Mr. T.W. M. Cameron,[4] a veterinary surgeon, dealing with the dog as a carrier of disease to man. Tuberculosis, rabies, and other diseases, together with parasites were all considered, but the remarks as regards the last-named were largely confined to helminths, and it was made clear that of these only *Dipylidium caninum* and *Echinococcus granulosus* need give rise to anxiety. It will be evident from Colonel Stammers's paper that, so far as London is concerned, the risk of human infection with these worms is negligible. Indeed, the examination of dog fæces showed no evidence of hydatid disease. Mr. Cameron in his paper does not deal with the question of intestinal protozoa, and the results here recorded will be noted with interest, though, of course, the investigation has been somewhat limited. The discovery of a new coccidium of the dog is, doubtless, its most outstanding feature.

BACTERIOLOGICAL FINDINGS.

It was considered that no useful purpose would be served by investigating the complete bacterial flora of the samples of dogs' excreta examined. In view of the fact that the research was mainly directed to the possible association of dogs' excrement with human intestinal disease, and more especially infantile diarrhœa, it was deemed advisable to proceed more or less on the lines followed by C. J. Lewis in his work for the Local Government Board.[5] He confined himself to a study of the non-lactose fermenters in the fæces of normal children and in those suffering from infantile diarrhœa as, of course, it is only the non-lactose fermenters which are concerned with the commoner epidemic diarrhœal diseases.

From the middle of May until July 12th, 1922, 100 samples of fæces, as found on London pavements, were bacteriologically examined. In collecting the fæcal material, care was taken that horse dung was not included, and only material which, in all probability, emanated from dogs was selected.

Technique.—A small portion of the sample was suspended in normal saline solution; from this plates of MacConkey's medium were inoculated, samples of non-lactose fermenting colonies being then taken into broth, from which a second MacConkey plate was prepared. These single colonies on the second plate were grown in broth, and the fermentation and other reactions were investigated. From the 100 samples of fæces, 43 non-lactose fermenters were isolated. Twenty-three of these, however, came under the heading of late lactose fermenters, and it is only the remaining 20 which showed no fermentation of lactose in 96 hours that were further investigated. The cultural characters of these 20 non-lactose fermenters are shown in Table I.

TABLE I.—*Cultural Characters of 20 Non-Lactose Fermenters.*

Specimen No.	Glucose.	Mannite.	Maltose.	Saccharose.	Lactose.	Dulcite.	Milk, 24 hrs.	Milk, 6 days.	Indol.	Voges Proskauer.	Motility.	Gelatin.	Group.
31	0	0	0	0	0	0	ALK	ALK	0	0	+	0	A
22	0	0	0	0	0	0	0	ALK	+	0	+	0	A
83	A	A	A	A	0	0	A	ALK	0	0	+	+	B
34B, 90	AG	AG	AG	0	0	0	A	ALK	+	0	0	0	C
71	AG	AG	AG	0	0	0	A	As	+	0	+	0	C
56, 63, 88	AG	AG	AG	0	0	0	A	ALK	+	0	+	0	C
35	AG	AG	AG	0	0	0	A	A	0	+	0	0	C
69, 86	AG	AG	AG	0	0	0	A	ALK	0	+	0	0	C
74	AG	AG	AG	0	0	0	A	A	0	0	+	0	C
93	AG	AG	AG	0	0	0	A	A clot	+	0	0	0	C
33, 98	AG	AG	AG	0	0	AG	A	A	+	0	0	0	D
18	AG	AG	AG	0	0	AG	A	ALK	+	0	0	0	D
23, 87	AG	AG	AG	0	0	AG	A	ALK	+	0	+	0	D
48	AG	AG	AG	0	0	AG	A	A clot	+	0	+	0	D

Results of Investigation.

It will be seen that the organisms may be divided into four main groups. In group A there are two organisms which do not ferment any of the sugars and which give the reactions of *B. fæcalis alkaligenes* and *B. metafæcalis alkaligenes* respectively. In group B there is only one organism, and it is of interest in that it liquefies gelatin in the same manner as Koch's comma bacillus; it possesses a single terminal flagellum, but does not form indol. In group C there are 11 organisms which produce acid and gas in glucose, mannite, and maltose, but do not ferment saccharose, lactose, or dulcite. Three of the organisms give the fermentation reactions of *B. paracolon*, Day. In group D there are six organisms which produce acid and gas in glucose, mannite, and maltose, but do not ferment saccharose, lactose, or dulcite.

Regarding the pathogenicity of these 20 non-lactose fermenting organisms, broth cultures were made, and two mice fed for five days on bread soaked with 2 c.cm. of the culture daily—i.e., a total of 10 c.cm. of the broth culture—was given to each pair of mice. The mice were kept under observation for one week after the last dose was given. One of the two mice receiving the culture from specimen 18 died 24 hours after the first dose, and an organism having the same fermentation reactions was recovered from the heart blood. The other mouse receiving this culture remained alive and healthy. A third mouse was also fed on this culture, but showed no signs of disease. One of the two mice, receiving the culture from specimen 90 and one from 31, died three days after the first dose. In the former case a dissimilar organism, having the reactions of *B. coli communior*, was recovered from the heart's blood, and in the latter case cultures from the heart blood remained sterile. One mouse receiving the culture

[3] A Study of the Fæcal Examinations of 1000 Imported Dogs, Veterinary Journal, 1920, vol. lxxvi., No. 9, p. 357.
[4] The Dog as a Carrier of Disease to Man, THE LANCET, 1922, i., 564.
[5] Report of the Medical Officer: Report on the Prevalence and Characters of Non-lactose Fermenting and Non-liquefying Aerobic Bacilli in the Fæces of Young Children under Normal Conditions and in Epidemic Diarrhœa during 1911.

from specimen 71 and one from 34B died six days after the first dose, and one mouse receiving culture 74 died eight days after the first dose, but in all of these an organism in pure culture, which produced acid and gas in dulcite, was isolated from the heart blood. This organism proved to be *B. enteritidis*, Gaertner. It appears, therefore, that these 20 non-lactose fermenting organisms which were isolated from 100 samples of fæces are not markedly pathogenic when taken by the mouth and, therefore, so far as this investigation goes, the presence of fæces on the pavements of cities does not appear to be a direct menace to man.

In this connexion it is interesting to compare the results obtained by Lewis, in his report on the Prevalence and Characters of Non-lactose Fermenting and Non-Liquefying Aerobic Bacilli in the Fæces of Young Children under Normal Conditions and in Epidemic Diarrhœa during 1911. Here mice were fed with 27 strains of non-lactose fermenting organisms from the fæces of normal children. Nine of these proved fatal, and in six cases the organism was recovered from the heart blood, whereas of 68 mice fed with strains from cases of infantile diarrhœa 33 died, and the organism was recovered from the heart blood in 14 instances.

HELMINTHOLOGICAL AND PROTOZOOLOGICAL FINDINGS.

From the public health point of view the examination of dejecta found on London pavements and road-gutters has not produced very much of interest so far as the helminthological aspect is concerned. The protozoological findings have yielded one interesting point—namely, the discovery of an eimeria of the dog. This organism, which is believed to be a new species and presents some unusual features in structure, is being described separately by Dr. C. M. Wenyon, of the Bureau, who has examined it critically. Two hundred fæcal deposits from pavements, collected mainly in an area comprising the neighbourhoods stretching from Gordon Street and Square to the upper end of the Tottenham Court Road were examined. Excepting where specific observation of the collector enabled him to state that the material was actually deposited by a dog, it is not possible to give the source of the specimens examined. The cat certainly must be taken into consideration, and on two occasions at least it is almost certain from the findings (i.e., *E. coli* and *E. nana*) that human fæcal deposits have been examined. Horse manure was excluded, the selection of fæcal material being restricted to that having the appearance of dog excreta.

It will suffice to give the results of examination in tabular form (II.).

TABLE II.—*Helminthological Findings.*

Characteristics of eggs.	Percentage in which found.
Tænia serrata type	2·0
Dipylidium caninum type	1·5
Ascaris type	3·0
Oxyuris type	0·5
Ankylostoma type	1·0
Trichocephalus type	0·5

Considering the object of the inquiry it was not deemed necessary to determine precisely the actual species of worm from which the ova observed were derived.

As a separate matter from the main investigation an attempt was made to correlate the findings of fæcal examination with the results of post-mortem examination. Dr. W. N. F. Woodland, of the Bureau (who suggested this), kindly did post-mortem examinations on 36 dogs, noted the helminths found in the intestines, and brought specimens of the contents of the bowel to me (G. E. F. S.) to see if the corresponding ova could be found. The results are shown in Table III.

In the two cases where *T. serrata* were present without corresponding ova being found in the gut contents

TABLE III.

Post-mortem findings in 36 dogs.		Examination of gut contents.	
Toxascaris limbata or *Belascaris cati*	6	Ova of ascaris	6
Tænia serrata	4	Ova of *tænia*	2
Dipylidium caninum	2	Ova not found	–
Ankylostomes not found	–	Ova of ankylostomes	1

the worms were fully mature. Careful search of centrifugalised deposit of an emulsion of gut contents, however, failed to demonstrate the presence of ova. The same may be said as regards the dipylidium cases.

The protozoological findings in the case of 200 fæcal deposits from London streets were as given in Table IV.

TABLE IV.

Parasite.	Percentage in which found.
Cysts of giardia	4·5
Coccidia (isospora)	1·2
Coccidia (eimeria)	1·2
Cyst of *Entamœba coli* type	1·0
Cyst of *Endolimax nana* type	0·5
Cyst of dimastigamœba type	0·5

In addition, on four occasions coccidia-like bodies were seen which, however, did not undergo development on further observation.

The proof that eimeria was definitely found in a sample of dog fæces requires to be stated. This proof was not always easily obtained. For example, a coccidium was found in three samples of street deposit. In only one instance, as will be seen, was it possible definitely to determine that the excreta examined were of canine origin. In specimen 125 a coccidium of large size was noted, and Dr. Wenyon's attention drawn to it. The organism bore some resemblance to the *Isospora* of the cat, but as there was no certainty as to the source of the deposit, and, moreover, as the coccidia were exceedingly scanty and development could not be followed, there was no means of being sure of the genus.

Again, in specimen 142 an abundance of a similar organism was noted. Dr. Wenyon followed out its development and proved it to be an eimeria having some distinctive features. Again, there could be no certainty that the specimen containing it was one of dogs' fæces, but the fact that ova of *Dipylidium caninum* were present was suggestive.

The laboratory assistant was then given instructions to work in the neighbourhood from which specimen 142 was collected, to watch, and, if he should be fortunate enough actually to take a dog *in flagrante delictu*, to procure a sample with precise details. In specimen 159, which is definitely recorded as having been deposited by a spaniel, a coccidium of the same type was again found.

A LESSON IN THE PREVENTION OF CATARRHAL DEAFNESS.

BY MACLEOD YEARSLEY, F.R.C.S. ENG.,
AURAL CONSULTANT TO ST. JAMES'S HOSPITAL, BALHAM; AURAL SURGEON TO THE LONDON COUNTY COUNCIL AND TO THE JEWS' DEAF AND DUMB HOME.

THE following case affords an interesting and instructive lesson in the prevention of deafness.

A boy, aged 10 years, was brought to me for increasing deafness. He had been under treatment by several surgeons and had twice undergone removal of adenoids. Both tympanic membranes were markedly indrawn, but of fairly normal texture. The tonsils had been well removed. The post-nasal space (as seen by means of Holmes's electric nasopharyngoscope) was free of adenoids, but somewhat encroached upon by enlarged posterior ends of inferior

turbinates, and the Eustachian cushions were swollen and congested. The nasal septum was deflected, moderately anteriorly, very markedly posteriorly, blocking the right posterior naris to a considerable extent. Whisper hearing was: R. 5 ft.; L. 1 ft. The nasal mucus gave an acid reaction.

I advocated a submucous resection of the septum, in opposition to the previously expressed opinion of one consultant, who considered that it would interfere with the normal development of the nose at puberty. My suggestion was accepted and the operation performed on May 10th, 1922. It was easy; the large posterior ends were also removed, and the absence of any adenoids confirmed.

I tested the boy on May 22nd and found that the whisper hearing (without any aural treatment) had increased to R. 15 ft., L. 10 ft., and, when I saw him again on Sept. 19th, it was over 15 ft. (the available length of my consulting-room) for both ears. The parents volunteered the information that his power of concentration was greatly improved. I tested the nasal mucus and found it alkaline.

There appears to be a prejudice (which at one time I myself entertained) existing among some rhinologists against the performance of the submucous resection operation before the age of puberty. Actual experience during the last two years has, however, satisfied me that any such prejudice is unjustifiable. Like many other prejudices, it is a bogey, with no foundation beyond fear. In another case this year, a boy, aged 12 years and 10 months, the result of the operation proved completely satisfactory in stopping an incipient catarrhal deafness. In this case also adenoids had been twice removed with disappointing results.

Testing the Nasal Mucus.

The lesson of these two cases seems fairly obvious and need not be laboured. I would, however, draw attention to one fact because it seems to me to throw some light upon the genesis of certain cases of chronic catarrhal deafness—viz., the fact that in both cases the nasal secretions were acid prior to operation and alkaline when the nose had recovered. I have tested the nasal mucus in this way in over 100 cases of distortion of the nasal septum. In 83 instances the reaction was acid, in the remainder alkaline. The amount of deformity varied, but I found that the acid reaction was always found in those cases in which the efficient drainage of the nose was interfered with. In such cases as were treated by operation, the restoration of nasal drainage resulted in an alkaline reaction of the nasal mucus.

There appears to be no mention of this reaction in the current text-books on rhinology. StClair Thomson [1] states that the nasal mucus "is inhibitory (Thomson and Hewlett), if not actively bactericidal (Wurtz and Lermoyez)," while Tilley [2] describes it as a "poor culture medium." For some time I have been inclined to consider imperfect nasal drainage, with alteration in the nasal secretions (probably from retention), as the key to chronic middle-ear catarrh. The normal reaction of the nasal mucus is alkaline and if it becomes acid from bacterial action when it is retained in traps formed by a distorted septum, it must act as a continuous irritant to the nasopharynx, into which it gravitates especially during sleep. This seems to be confirmed by my observation [3] that the first ear to be attacked in chronic middle-ear catarrh is that on the side upon which the patient usually lies during sleep and in which the nasal secretion collects and bathes the Eustachian orifice.

[1] Dis. of the Nose and Throat, 2nd edition, 1916, p. 7.
[2] Dis. of the Nose and Throat, 4th edition, 1919, p. 9.
[3] Jour. of Laryngology, xxx., 182.

HARROGATE MEDICAL SOCIETY.—The annual oration was delivered on Nov. 4th by Sir James Purves-Stewart, on the Clinical Significance of the Cerebro-Spinal Fluid. On Nov. 16th Mr. A. B. Pavey-Smith read a paper on Headache. He suggested a classification of headache for clinical purposes into three groups: intracranial, cranial, and extracranial, on the basis of the presumed anatomical origin of the pain, as preferable to the usual classification based on the condition of which the pain was a symptom. The relation, for purposes of differential diagnosis, between the clinical types and their anatomical origin was described.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE.

A MEETING of this section of the Royal Society of Medicine was held on Nov. 24th, Dr. R. J. REECE, the President, being in the chair.

Dr. F. M. TURNER read a paper on the

Age and Sex Distribution in Scarlet Fever,

submitting a full biometric analysis of the statistics of age distribution amongst notified cases in London and cases admitted to the Metropolitan Asylums Board's hospitals, together with tables relating to certain provincial cities. The age distribution differed more than would be expected, were the fluctuation random, in successive years. The mean age of females in notified cases was always higher than that of males and, with one exception, in the admitted cases. The mean ages of patients notified uniformly exceeded that of those admitted. The statistics showed a general tendency for the mean age to increase with the prevalence, although the arithmetical value of the coefficient of correlation between mean age and number of cases notified was small. The mean age has increased over the period studied (1887–1922). Manchester statistics likewise showed an apparent increase of mean age in periods of prevalence and a general increase of mean age through the series.

Dr. W. H. HAMER pointed out the existence of a tendency for the mean age and the prevalence to increase together in the case of small-pox mortality statistics. In his view the phenomenon was dependent upon changes in the amount of susceptible material in the population; this explanation best accounted for the epidemiological course of measles. Measles was an easy case, influenza a very difficult one; scarlet fever fell between the two.

Dr. L. ISSERLIS, in commenting upon the statistical aspects of the paper, remarked that the application of the theory of sampling to a problem such as this involved theoretical difficulties, so that it was necessary to be particularly cautious in drawing inferences as to the limits of chance fluctuations.

Dr. MAJOR GREENWOOD suggested that the smallness of the coefficient of correlation between prevalence and mean age might be due to non-linearity of regression, so that the prima facie inference that the correlation was a real one might be justifiable. The biological interpretation of this suggested by Dr. Hamer seemed the most feasible.

Dr. JOHN BROWNLEE said that it was essential to bear in mind the factor of mass of infection; whenever the mass of infection was great, for instance in milk epidemics, the mean age of attacked persons was high.

Dr. J. C. MCVAIL inquired whether the excessive incidence upon females might not be accounted for by the greater proportion of females in the general population at susceptible ages.

Dr. W. BUTLER commented on the difference between the age incidence in a disease such as scarlet fever, to which the whole population was not susceptible, and that of a disease such as small-pox attacking an unvaccinated population. It appeared that in the former case immunity came with age and that an accumulation of susceptible material was not the whole explanation.

Dr. TURNER, in reply, remarked that an obviously possible explanation of the higher mean age of females attacked was that the girls nursed children in the interval before the latter were removed to isolation hospitals.

Dr. BROWNLEE read a communication on the

Relation Between Rainfall and Scarlet Fever.

He exhibited an extensive series of charts which led him to conclude that the influence of deficient rainfall

upon the prevalence of scarlet fever, to which the late Dr. Longstaff had devoted special study, was not a direct one. There was some evidence that if a period of deficient rainfall coincided with the epoch at which, from a study of the periodicity of the disease, an epidemic was to be expected, the rainfall deficiency increased the magnitude of the epidemic; deficiency of rainfall was not, however, a sufficient single cause of an epidemic.

Sir GEORGE BUCHANAN inquired whether the English rule that scarlet fever was an autumnal epidemic was universal, and whether grouping rainfall in smaller than annual units had been tried.

Dr. BROWNLEE said that the case in favour of deficiency of rainfall as a precursor was not strengthened but weakened when a finer time unit was adopted.

HUNTERIAN SOCIETY.

INSANITY IN RELATION TO CRIMINAL LAW.

A MEETING was held on Nov. 20th at the Cutlers' Hall with Dr. FORTESCUE FOX in the chair, when a discussion on this subject was introduced by Dr. PORTER PHILLIPS, superintendent of Bethlem and Bridewell Hospitals.

Dr. Phillips said the discussion must be on the question "Is the person responsible in the sense of being liable by the law of England as it is to be punished for the act which he has done?" In the course of an address, which he cut down drastically during delivery, he reviewed the psychological and sociological aspects of human life, showing how the self-control exacted from the individual by society was combated by the underlying primitive instincts of the poorly evolved man. Society had to keep law and order and inflict penalties on those who broke the law, while punishment was designed to be retributive and deterrent, depending first on the nature of the crime, and secondly on the degree of responsibility. The quality of responsibility had to be assessed when such a nebulous phase of mind as insanity was encountered.

Dealing with conduct, Dr. Phillips discussed the theory that mind was a process with only a definite physical basis, pointing out that it was the storage of experience which supplied motives of our conduct, when the Freudian school insisted on the prominent part played by sexual repressions. As for the suggestion that every thought and action was predestined acceptance of this theory would mean that from the absence of free will there was no responsibility. Dr. Phillips then explained and discussed the well-known McNaughton case, pointing out that although the McNaughton judgment was 80 years old there had been little advance on it, in spite of very strong feeling amongst the medical profession that the state of law in this country in respect to criminal responsibility was very unsatisfactory. Dr. Phillips concluded that no external conduct, whatever its social consequences, would be punished in criminal law unless there is intention to do what is known to be illegal, a process which on analysis would be found to consist of three elements: (1) The power of volition—the individual is able to help doing what he does; (2) knowledge—that is, the offender knows that he is doing wrong; (3) foresight—that is, the power of foreseeing the consequences of his act. But, he pointed out, voluntary action, which must be initiated and completed under the ægis of volition, was opposed to reflex and instinctive acts which did not involve the influence of conscious control. It was impulsive action when associated with crime that gave rise to serious controversy when the question of responsibility was under consideration. He thought that the plea of insane impulse might be reasonably accepted when there was other evidence of mental impairment. It was known that an individual might suffer from an impairment of many of the attributes of mind without influencing his conduct. Inattention, imperception, disorientation, and loss of memory might be present even with hallucination or delusions, yet the individual could not be deemed insane without a corresponding disorder of conduct. It was only when conduct became disordered that the medico-legal label of insanity could be attached to any particular case. Insanity could only be defined after defining the normal state of sanity which presented the very greatest difficulties since the latter was a purely relative term. He proposed as a definition:—

> "Insanity in its medico-legal sense is a disordered condition of the function of mentation, due to functional or organic disease of the central nervous system, manifesting itself by a mental reaction of such an abnormal character that the individual concerned, by his unreasonable language or conduct, alienates himself from, or enters into conflict with, the usual recognised ideas, habits, or customs of the social body to which he belongs. Moreover, this quality of the person must be of such a character and degree as to necessitate the exercise of care and control over the individual."

English law, he continued, divided insane persons into two classes: those over whom the prohibition of the criminal law exercised no control, and on whom, therefore, it would be gratuitous cruelty to inflict punishment; and those whose form of insanity was (as Lord Bramwell put it) such that "they would not have yielded to that insanity if a policeman had been at their elbow." From the purely psychological point of view this classification was open to objections, for the second category suggested that the irresponsibility of the mentally disordered person did not exist.

The question of delusions which the judges in their reply to the House of Lords in 1843 wisely refrained from mentioning was apt to bulk largely in the minds of juries, to whom the presence of a delusion suggested irresponsibility. Alienists knew well that many patients suffering from delusions could be held responsible for crime under the present legal test. He quoted the modifications in legal interpretations suggested by Sir J. FitzJames Stephen as being generally accepted in practice though not officially sanctioned.

After discussing the influences of alcoholism, epilepsy, and hysteria, Dr. Phillips passed on to draw attention to certain ill-defined points which might be adjusted by those responsible for framing the law, so that law and medicine should come into agreement upon the conceptions of responsibility, the definitions of delusion, and the position occupied by medical evidence, especially in cases where the individual suffering from mental disorder was prevented from controlling his own conduct owing to the fact that this absence of power of control had been produced by his own default. Here it is held by the law that the man is responsible for his criminal act, but in the eyes of many psychologists this proviso was, Dr. Phillips concluded, unfair. He held that all first offenders indicted for crime, as in cases of theft, arson, indecent exposure, where the motive was not clear, should receive special attention, as some evidence of mental disease might be forthcoming. The prison medical officer had ample opportunity of observing the prisoner, but some non-obvious cases would require an experienced alienist. In cases of murder only was the question of insanity pushed to its fullest limits, and this question was of necessity left to the jury to decide. As it was essentially a medical question, Dr. Phillips thought that in every murder case the Crown should appoint an impartial tribunal composed of at least four medical experts, including the prison medical officer under whose immediate care the accused had been placed. This tribunal should investigate not only the prisoner's mental state while in prison, but also his whole worldly setting, and should give their opinion before the jury. He quoted the cases of Holt and True.

Discussion.

Sir FRANCIS NEWBOLT, K.C., said that it should be generally known that the attitude of the court was always considerate to the accused, and that a distinction should be drawn between conviction and sentence.

The question the jury had to settle was "guilty" or "not guilty," the sentence was left to the judge. Medical evidence always received its full weight. In the Maybrick case, for instance, although the accused was found guilty she was reprieved as it was thought that the evidence did not amount to absolute certainty. In the Penge case Judge Hawkins was charged with not having put to the jury with sufficient force the fact that medical evidence showed that it was possible that the victim died of some unrecognised disease and was not deliberately starved to death. The jury found all four prisoners guilty and no evidence would have convinced them otherwise. The public did not know that an accused person might plead either that he was insane at the time of his act, or that he was insane at the moment of his trial. Murder should be distinguished from all other crimes in that the sentence if the prisoner be found guilty, must be capital. But the case of True showed that even after sentence there was still hope of reprieve on the grounds of insanity.

Dr. T. B. HYSLOP said that the legal definition of insanity had been in question since the McNaughton ruling, and that he had spent 23 years as a physician at Bethlem and had come to the conclusion that three was as much knowledge of right and wrong inside that institution as outside; this knowledge, therefore, could not be a proper test. The law was reluctant to agree that loss of control was possible without actual insanity. In this connexion he said he had once been asked by a prominent jurist, who would not agree to this possibility, to see his valet "who had been acting peculiarly lately." He had to report that the valet was perfectly sane, but had an increasing impulse to cut his master's throat.

A Formula for Insanity.

Sir RICHARD MUIR said that both the legal and medical professions had made great efforts to find a formula for insanity which would satisfy the other party and the general public. In 1896 the Medico-Psychological Society's Committee investigated two questions: (1) What are the defects in the administration of criminal law as it affects insane persons; and (2) how are they to be remedied. Their answer to (1) was in effect that there were no defects, although the legal definition was open to criticism on purely theoretical grounds they admitted that, in practice, the definition allowed justice to be done, and that any other definition was "wellnigh impracticable." As regards automatism, he pointed out that he had defended a man on three occasions and obtained two acquittals, on a plea of epileptic automatism. On the third occasion the judge remarked that this plea amounted either to insanity or to nothing, and the man was shut up in Broadmoor. Unless it was suggested that trial by jury should be abolished, the definition must stand as at present, or the medical profession must find a definition acceptable to themselves and understandable by a jury. The legal profession was anxious to keep abreast of medicine, and would accept a new definition subject to the above condition, and to its ability to protect the public.

Dr. W. C. SULLIVAN said that the catastrophe of the hanging of an insane person rarely occurred because of the investigation of each case by the Home Secretary after conviction. But the position of the medical expert in a law court was a difficult one. Instead of asking whether the man was insane and whether the acts were likely to arise from his insanity, the law insisted upon an intellectual test—the knowledge of the difference between right and wrong. There was an idea also that delusions were a necessary accompaniment of insanity. He pointed out that in many cases the delusions came after the act.

Dr. PHILLIPS in reply agreed that the question of insanity must be settled by the jury, but he thought that medical evidence on the basis of modern psychological medicine was belittled by the legal profession. Great advances had been made in psychological medicine since the committee of the Medico-Psychological Society brought out their report in 1896.

MEDICAL SOCIETY OF LONDON.

BLOOD TRANSFUSION IN CIVIL PRACTICE.

A MEETING of this Society was held on Nov. 27th, Lord DAWSON OF PENN, the President, being in the chair.

Mr. GEOFFREY KEYNES introduced a discussion on Blood Transfusion in Civil Practice. He said that the practice of blood transfusion had been a subject of experiment for nearly 300 years, animals only having been used as the donors during a great part of that time. All the symptoms now grouped under the heading of incompatibility were known, and even hæmaturia was observed, in the seventeenth century. The first book on the subject was published in 1668. Mr. Keynes showed photographs of the earlier instruments used for the process, an important modification being that of Higginson in 1857—the original Higginson's syringe. During the last 30 years most of the contributions to the science of transfusion had come from America. Direct transfusion was worked out in greater detail by Crile at the beginning of the present century, but direct transfusion was now only of historical interest.

There were now two transfusion schools: (1) those who held that plain whole blood should be used; (2) those who believed that blood containing an anti-coagulant was efficient. The Kimpton-Brown tube was used for the whole-blood method, and it was satisfactory in the hands of those who were accustomed to it. But it was the use of an anti-coagulant which popularised transfusion and made it a certain and easy process. The blood was allowed to run through a wide bore needle from the donor's vein into a flask containing the requisite quantity of sodium citrate solution. An air-lock allowed accurate control of the transfusion, and rendered the introduction of any quantity of air into the recipient's vein almost impossible. Until 1907 many fatalities attended transfusion, and a large number of these were attributed to air bubbles. A little air could, however, be introduced without doing harm. Blood incompatibility was first convincingly demonstrated and worked out by Jansky, in Sweden. Jansky worked out four groups of blood, and four years later Moss published a grouping, in which Nos. 1 and 4 were reversed. This had led to so much confusion that two years ago an American medical committee decided that the notation of Jansky only should be used; the same course was desirable in this country, as misunderstanding was liable to result in fatalities.

Post-Transfusion Reactions.

The subject of post-transfusion reactions was a very complicated one, and it was not solved by the mere matter of blood-grouping; moreover, even blood-grouping, in the present stage of knowledge, could only be tentative. Post-transfusion reactions could be divided into severe and slight. The cause of the severe reactions, was incompatibility. The reaction came on often after giving only a small quantity of blood. If the blood grouping was properly done this severe category of reactions could be eliminated. In these severe cases, after giving 50 to 100 c.cm. of blood, there were tingling pains all over, the pulse slowed, and pain in the præcordium was complained of. There might be pain in the lumbar region, the face might become suffused, and the patient lose consciousness, later developing an urticarial rash and showing signs of collapse; there might be delirium. When urine was passed it was found to contain hæmoglobin.

The slighter reactions were difficult to understand. Some held the anti-coagulant responsible for these, but when a series were taken in one of which anti-coagulant was used and in the other not, the proportion of such reactions was the same. Large quantities of sodium citrate could be given without bad effects. Another factor which had been held responsible was the changes which might take place in the blood preparatory to the formation of a clot; certainly changes took place as

soon as the blood left the vein of the donor. But defibrinated blood could be transfused without any reaction greater than in the case of whole blood containing sodium citrate. Anæsthetics had also been held responsible for the reactions, but Mr. Keynes did not think they were wholly to blame. It had been suggested that in addition to the major agglutinins, which could be eliminated by proper grouping, there were minor agglutinins, difficult to demonstrate, which could not be so eliminated. A further suggestion was that the effect was produced purely by the introduction into the circulation of a foreign protein; enough was not yet known about the normal proteins in the blood and their variations in individuals. Distilled water for dissolving the anti-coagulant, unless used quite fresh, might be highly toxic. Slighter reactions did not usually appear until towards the end of the transfusion, or even afterwards. Mr. Keynes did not regard these slighter reactions, however, as of very great importance, and he had never seen them interfere with the efficacy of the process; they did not appear to herald a destruction of the corpuscles of the blood which was being administered. No alarm need be felt even if the pulse-rate rose to 150. A moderate reaction might follow a second or a later transfusion, but that was not always observed, though repeated transfusions were fairly common in such conditions as pernicious anæmia. This reaction might be a true anaphylaxis, the patient having been sensitised by the injection of a small quantity of foreign protein. This reaction could not be eliminated by even the most careful grouping.

With regard to the indications for transfusion, Mr. Keynes gave a table of these, grouped under various headings.

Indications for Blood Transfusion.

The first and greatest indication for it was severe hæmorrhage and shock, replacing the blood which the patient had lost. It was not possible to dissociate hæmorrhage from shock. Ruptured ectopic gestation and post-partum hæmorrhage were peculiarly suitable cases, although a pregnant woman had the power of rapidly regenerating blood. Gastric ulcer, especially in young patients, was another type of case suitable, and in some of these any further hæmatemesis was avoided. Another group of cases was the pre-operative. Many cases which were a serious operative risk on account of previous debility, as in carcinoma, were rendered an ordinary risk by prior transfusion. Another class were those patients who had had considerable hæmorrhages before the question of operation had arisen; in this group were included certain cases of gastric ulcer. A middle-aged man might have a sudden severe hæmatemesis without previous symptoms, and he might have a second hæmatemesis soon afterwards. The surest way of saving such a patient's life was to transfuse him, then operate at once, not waiting until his life was endangered by a second hæmatemesis. In the case of a Wertheim operation, the patient would be greatly benefited by a pre-operative transfusion. The benefit of transfusion lay not only in the corpuscles which were given, but also on the stimulation given to the formation of new blood.

With regard to post-operative cases, he had given transfusion after the removal of a large naso-pharyngeal sarcoma, and after abdomino-perineal resection of the rectum. Hæmorrhagic diseases generally, and hæmophilia in particular, were greatly benefited by transfusion, though it was not a specific, as hæmophilia could be treated by other means. Melæna neonatorum was always greatly benefited by transfusion; purpura, however, was only slightly, if at all, improved thereby. In the pyogenic infections the results were doubtful at present, but the future might be hopeful in regard to these, especially after the recent work of Sir Almroth Wright. Gas poisoning and benzol poisoning yielded well to transfusion, and Bruce Robertson, in Canada, had used it with great effect in cases of severe burns. Generally speaking, the use of transfusion in this country was restricted; it had made much greater strides in America, and in the present state of knowledge its limitations were definite. Post-transfusion reactions could not be entirely eliminated whatever the method used. It was difficult to judge what was the best moment for transfusion, but perhaps the clinical condition of the patient was the best guide.

Discussion.

Mr. GORDON TAYLOR expressed his preference for the whole-blood method; he used the Kimpton tube. He had seen only one case of post-transfusion reaction. He spoke highly of blood transfusion in pneumococcal peritonitis. He used it also in chronic jaundice in connexion with impaction of stones in the common duct, and carcinoma of the pancreas. It was better than calcium chloride or horse serum for increasing the coagulation time of the blood. He used it also for what he called operations of magnitude, and in many pre-operation cases, such as malignant disease of the bowel and carcinoma of the cæcum. Post-operative hæmorrhages, such as after excision of the prostate, were greatly benefited by the method. "Weeping" gastric ulcers, if transfused, could be saved from operation in many cases.

Dr. A. E. GOW dealt with the matter from the medical standpoint, instancing cases of secondary anæmia, bacterial endocarditis, encephalitis lethargica, and influenzal pneumonia as types of cases in which transfusion was very beneficial; also in the preparation of medical cases for surgical operations. He thought it better to give a small dose of blood—200 c.cm. or so—and repeat in five or seven days, than to give one transfusion of a large quantity.

Dr. ALEXANDER FLEMING said transfusion after hæmorrhage and secondary anæmia due to disease was of undoubted value, but to decide when transfusion should be done was sometimes difficult. He referred to the work done in the war by Robertson and Brock on the volume of the blood in bad cases of hæmorrhage, in which the anæmia was very severe. The total hæmoglobin in the blood in these cases was seriously reduced. A good indication of this loss was derived from the blood-pressure readings. When the hæmoglobin was reduced below a certain stage, regeneration of blood from the marrow did not take place, but if a transfusion were given and the hæmoglobin content raised, the marrow again functioned. Generalised streptococcal infections were greatly benefited by adding a small quantity of vaccine to the blood, for it increased the bactericidal content.

Sir THOMAS HORDER spoke hopefully of the operation of transfusion producing even more benefit in the future. He considered that the healing of gastric ulcer was more rapid after transfusion; in peptic ulcer the benefit was very impressive. It was also valuable in the treatment of ulcerative endocarditis.

Mr. KENNETH WALKER spoke particularly of benefit which often followed the transfusion of not more than 200 c.cm. of blood in a bad surgical case. In genito-urinary surgery the number of cases in which transfusion rendered a severe operation possible was great, and it also facilitated healing in stubborn cases.

Mr. EARDLEY HOLLAND referred to the cases in the practice of gynæcology in which transfusion was specially valuable; indeed, he believed he could not get on satisfactorily with his work without it. He considered it an essential for saving life in cases of ectopic gestation, of which at the London Hospital there were 60 to 70 cases a year. It was also very valuable in patients who had repeated hæmorrhages.

Mr. KEYNES briefly replied.

MANCHESTER PATHOLOGICAL SOCIETY.

A MEETING of this Society was held on Nov. 8th when Prof. SHAW DUNN read a paper on

Some Aspects of Acute Nephritis.

Prof. Dunn referred to the impetus which the study of the minute morphological changes in the kidney in acute nephritis has received of recent years, on the one hand through the wealth of material afforded by the appearance of the disease in epidemic form in the

armies of the western theatre of war, on the other hand by the acquisition of a fuller knowledge of the minute structure of the normal kidney. The modern conception of the kidney as an organ composed of nephrons or units each composed of a glomerulus and tubule with a blood-supply rather more than less of their own, has an important bearing on the interpretation of diseases of the organ. The correlation of disturbed anatomy and disordered function becomes more interesting and more fraught with possibilities and with clinical profit. The majority of cases of nephritis dying in the acute stage show histologically predominantly a diffuse glomerulo-nephritis. This has been the case not only in the war necropsies but in civilian practice as well. The glomerular capillaries are blocked by proliferated endothelium and leucocytes—that is, the lesion is a vascular one. At times there occur in addition catarrh and accumulation of desquamated cells in Bowman's capsules, this type of lesion generally being more destructive to the kidney as a whole. Prof. Dunn analysed the results of his investigations on the kidney, both in cases clinically diagnosed as acute nephritis and also in a further series where no special renal disturbances had been noted during life, but where the naked-eye appearances had led him to make detailed studies. In two cases with œdema, dying of uræmia and coming to post-mortem, a diffuse glomerulo-nephritis was present of such degree as to give the impression that renal function had been largely arrested. The cases which were incidentally discovered at necropsy fell into two histological groups. A small group corresponded closely to Gaskell's focal embolic nephritis, plugs of thrombus being found in the glomerular capillaries. The second type showed a condition similar in kind to that exhibited by the uræmic cases, but less in degree. It was interesting to note that these latter all occurred in cases dying of sepsis of some kind, and it would appear that this is a most important factor in the causation of diffuse glomerulo-nephritis. On the extent of such a glomerulo-nephritis, an extent which varies from case to case, depends the presence and quality of physical signs of kidney disease. In those cases where bacteriological examinations were carried out the infecting organism was found most commonly to be the hæmolytic streptococcus pyogenes.

ROYAL ACADEMY OF MEDICINE IN IRELAND:
SURGICAL SECTION.

A MEETING of this section was held on Nov. 17th, Sir ARTHUR CHANCE being in the chair. Sir WILLIAM I. DE COURCY WHEELER, the President, delivered an address on

What Makes for Success in Surgical Treatment.

He referred to the part played in the development of Irish surgery by his predecessors in the chair, and in a plea for better team-work, he stated that it was as easy for a single general in the field, without the aid of a staff of experts, to control aircraft, tanks, artillery, transport, and all the paraphernalia of modern warfare, as for a surgeon to undertake single-handed the many complexities of even a single case. He instanced the fallacy of sending specimens for report to a pathological laboratory at a distance. For the surgeon never to see the pathologist, and the pathologist never to see the patient was an insult to modern thought. Team-work could be carried on to some extent at least without extra staff and without extra cost. He urged the necessity for travel for those about to undertake hospital appointments. On the question of operative procedure, the President spoke of the preparation, the ritual of the operation, and the after-treatment of patients. He said that he gave alkalies for several days before operation, and added glucose in certain cases. No laxatives and no enema were given. As a rule, surgical cases free of fever and non-drainage cases were allowed up two or three days after operation. Hot operating theatres were to be condemned. In connexion with the calamity of pulmonary embolism, the part played by morphia, the Trendelenburg position, the Fowler position, and the immunity of children, were discussed. The aim of the surgeon should, according to the President, be the healing of a wound without any local or general reaction whatever, followed by a convalescence with little or no pain or discomfort. Union by the so-called "first intention" could be easily obtained, but this might be far from the finality of perfection. The combination of local anæsthesia with general anæsthesia as a routine in surgery was urged. The President concluded by contending that it is only by throwing a searchlight on defects in surgeons and in institutions that progress could be made. The younger surgeons should not court popularity, nor be afraid of jealousy, for this was the tribute paid to youth for successful enterprise in thought or in action by minds which suffer from the atheroma of advancing years.

Dr. L. L. CASSIDY, while praising the high level of surgery in Dublin, thought that an institution was needed in Dublin to deal purely with problems of research. He himself hoped to establish a biochemical laboratory at the Coombe Hospital.

Dr. T. T. O'FARRELL thought that the progress of surgery and medicine in Ireland had been handicapped by the fact that progress in science went with progress in commerce. Twenty years ago Germany had the lead in medicine. Later England did well, but now, in his opinion, America was ahead of all the other countries. The reason for this might be the commercial prosperity of America, where much money was given to aid research work. Students should be taught from the beginning the importance of team-work.

Dr. T. P. C. KIRKPATRICK said that the first thing that made for success at an operation was that everyone concerned should remember that they were treating not a case but a sick person. The patient should be consulted as to what hospital or home he would like to go to, and the anæsthetist should be given an opportunity of examining the patient before the operation. What seemed to him to be most lacking in Dublin was the accurate recording of cases by the men who observed them.

Dr. T. G. MOORHEAD stressed the extremely important part played by an operation not only as regards a patient's physical welfare, but also as regards his mental welfare. In every case of surgery, except minor operations, it was, in his opinion, essential for the individual to take things easily for three or four months at least, since an operation was a shock to the nervous system. Nearly every day he came across patients suffering from post-operative neurasthenia, which could only be prevented by prolonged post-operation rest. The need for a pathological chemist in Dublin was undoubted; he was handicapped in almost every branch of his work by being unable to get chemical work done. In regard to the choice of a nursing home, the physician or surgeon, not the patient, should be consulted, for physicians and surgeons did their best work in the home to which they were accustomed.

Dr. DOROTHY MILNE HENRY urged the importance of giving attention to minute details in the conduct of a case.

Sir ARTHUR CHANCE said that one heard great praise of Irish surgery, and wondered if this praise was really deserved. He would like to know if there was any team-work done in Ireland. Was any genuine inquiry made in the majority of cases as to the progress after operation? He did not think so. While in America he visited a hospital in which there were 110 beds on the surgical side, and four shorthand writers to take notes of the operations. The President had said that the students after completing their course should travel. In the speaker's opinion the people who should travel were the hospital managers, in order that they could learn how things were done in other places. He thought they should subscribe to a fund to enable them to

do this. In America a surgeon never did more than one big operation a day. He believed that the reason why quacks, by which he meant unqualified practitioners, were so successful was that they possessed much more practical knowledge than the average medical student. He agreed with Dr. O'Farrell that scientific advance was associated with commercial prosperity. In conclusion, he thanked the President for his careful and suggestive paper.

ULSTER MEDICAL SOCIETY.

A MEETING of this Society was held on Nov. 16th, with Prof. R. J. JOHNSTONE, the President, in the chair, when Dr. W. CALWELL read a paper on

Dementia Præcox from the Standpoint of the Ordinary Physician.

He said that many considered dementia præcox was also a class by itself, and was as distinct from other forms of insanity as was general paralysis. He enumerated Kraepelin's chief distinctions—viz., the onset during adolescence, the remittent course of the disease, the peculiar mental symptoms, the termination in complete dementia, the non-fatal course as regards life. All these points presented exceptions. The mental symptoms were marked by a peculiar disruption of the psychical unity. In the earlier stages perception, memory, and general understanding were wonderfully good, but interest in work, volition, and conation were markedly impaired. This led to the use of the term schizophrenia, and had been called mental ataxia. The response to a stimulus was quite out of keeping with the nature of the stimulus. A suspicion could be entertained that the motor equivalent cells in the frontal and pre-frontal areas degenerated first. These cells were the physical basis of will and judgment. As the higher functions slowly failed the lower functions, obeying Hughlings Jackson's dictum, acted independently. The extent of the disease was greater than was generally thought. Statistics showed that between 10 and 25 per cent. of all admissions to asylums were cases of dementia præcox, and the progressive dementia left these institutions blocked with these cases. The pathology of the disease was not definitely established. Mott's findings of nerve-cell degeneration in the cortex, and regressive atrophy of the seminiferous tabes in the testicle, and analogous changes in the ovaries were accepted, and his genetic explanation of a cortical cell weakened in its growth was nearest the truth.

Dr. W. R. DAWSON said that the sort of person who was most liable to dementia præcox was the quiet, studious, self-centred boy who did not care for games or for mixing with his fellows. The great characteristic of the disease was the loss of emotional reaction, with relative retention of other faculties of mind, but there were other symptoms that were suggestive, especially the so-called "pseudo-hallucinations" and a state of puzzledom due to inability to understand the new morbid ways in which the mind worked. In a smaller way bursts of senseless laughter and a peculiar smile were also suspicious. The three varieties—hebephrenia, catatonia, and paranoid insanity were briefly touched upon. Dr. Dawson believed that the first and the second were less hopeless than the last-named. He gave a short account of a case of his own which recovered absolutely and remained well when heard of years after, but recovery was not frequent, although some cases eventually recovered their balance on a lower mental level. As regards the pathogenesis, he thought that Mott's observations on the sexual organs must be taken into account. In his opinion there was no necessary opposition between the pathological and the psychological theories. The condition might be described as the result of morbid influences arising from the diseased sexual glands acting on brain cells of abnormally low deviability, and producing degenerative changes with failure to adjust to the environment, attempts at abnormal adjustment, and consequent mental breakdown.—Prof. J. A. LINDSAY and Dr. T. M. ADAMSON also spoke.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

A MEETING of this society was held on Nov. 17th, when Dr. GRACE ANDERSON read a paper on the

Sequels of Lethargic Encephalitis in the Child,

based on 33 cases that recovered from the primary attack. These children suffered from similar and typical disturbances. The sequelæ were: (1) Nocturnal wakefulness and excitability; and (2) psychical disturbances, which include changes in disposition, mental impairment, and habit peculiarities. Persistent insomnia with extreme motor unrest and excitement during the night was followed by lethargy during the day. The prognosis as regards complete recovery was bad. Among the psychical disturbances, which in most cases followed a long period of nocturnal insomnia, disobedience, bad temper, cruelty, even kleptomania, appeared in previously good children. Mental or memory impairment was absent except in ten cases where the change of disposition was not marked, but the children were unable to check the impulse to do wrong. The habit peculiarities most frequently met with were spitting and hysterical dyspnœa, which persisted long after the normal sleep sequence had been regained. The former was not a true sialorrhœa since the habit could be controlled for a long period without accumulation of saliva.

Prof. EDWIN BRAMWELL (Edinburgh) communicated

Remarks Upon Lethargic Encephalitis,

with special reference to the late symptomatology and persistent after-effects of the disease. He explained that the official figures were apt to give an exaggerated impression as to the fatality of the disease, since mortality figures were based upon notified cases. Of 56 cases personally observed up to 1919 only nine died, and among a larger number of cases a mortality of not more than 20 per cent. occurred. This corresponded with the conclusions arrived at by an American committee appointed to study the subject. Of the deaths probably four-fifths occurred within the first month. Complete recovery was exceptional. The effects of the disease tended gradually to improve although relapses might occur. The most common after-effect was, probably, a general lack of physical and mental energy. Initiative, discrimination, and judgment appeared impaired, as also were memory, concentration, and decision. Some of these symptoms probably were directly dependent upon the pathological process and some might be caused by a superimposed neurosis. The mental phenomena observed in the developing brain often differed materially from those observed in the adult. Various pareses and even an Argyll Robertson pupil might occur. Diagnosis from brain tumour might be difficult when an encephalitis manifested its presence by producing a progressive hemiplegia. In some cases various abnormal movements might appear months after the acute attack. Coarse tremor, general motor restlessness of choreic type, twitching of the face, irregular movements of the diaphragm, purposeless movements of one or more limbs were among the phenomena observed. One patient increased greatly in weight. The Parkinson syndrome was not uncommon; the certain diagnosis from true paralysis agitans was not always easy in the absence of a history of an acute illness.

Dr. HENRY J. WATT reported the results of his application of the Binet (Burt) tests to a score of children who had had the disease. The mental ratio was found to be on the average 68 ± 8. This figure might be compared with the average mental ratio of 114 children in the Royal Hospital for Sick Children, Glasgow—viz., 88 ± 16. The intelligence of the child thus seemed to be distinctly impaired by the disease in the few cases examined.

Dr. JOHN THOMSON (Edinburgh) noted resemblances between the symptoms in some of the slighter cases of epidemic encephalitis in children and those often seen in severe chorea. The local lesions set up in the

brain were not dissimilar. Recent work seemed to show that the essential lesion in chorea consisted in a slight diffuse or disseminated encephalitis. Dr. Thomson spoke of the great frequency of noisy hyperpnœa as a symptom of epidemic encephalitis in children. This sort of "panting" was a noticeable feature, and it was of diagnostic importance when the other manifestations of encephalitis lethargica were indefinite.

Prof. T. K. MONRO suggested that the so-called sequelæ are possibly due to a lighting up of an old lesion—that the disease was still active after a year or two. The late symptoms were a Parkinsonian condition, weakness of muscles, and fixity of features, often without tremor. He was not familiar with severe mental derangements.

Dr. D. K. HENDERSON, speaking from the point of view of the psychiatrist, said that in institutions a fairly acute type of organic reaction was generally met with. The end-result seemed to be more a state of emotional dulling or stupor with retention of memory and intelligence. Dr. Henderson questioned the value of the tests mentioned by Dr. Watt.

Dr. IVY MCKENZIE also doubted the value of these tests. He stated that, in over 100 cases, he had not seen one case of complete recovery nor one of genuine alienation.

Dr. LEONARD FINDLAY referred to the difficulty of diagnosis. He agreed that complete recovery was rare. Many cases were only diagnosed from the sequelæ. It was uncertain whether the late symptoms were due to fresh outbreak or to the results of cicatricial contraction. There was never febrile disturbance. He considered Dr. Watt's tests good, and that they proved that the children tested were inferior to those unattacked at the same age.

Reviews and Notices of Books.

HEWITT'S ANÆSTHETICS AND THEIR ADMINISTRATION.

Fifth edition. Edited by HENRY ROBINSON. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. Pp. 576. With 2 plates and 83 illustrations. 30*s*.

IT is well that the untimely death of Sir Frederic Hewitt has not been allowed to prevent a further edition of his well-known text-book. The careful and comprehensive character of Hewitt's work gave to his book just those qualities needed to make it a standard volume and to enable it, with the additions and alterations demanded by fresh information, to hold this position for many years. These additions and alterations have been skilfully combined in the present edition by Dr. Henry Robinson and the book retains its high quality. For the chapters dealing with the pharmacology and physiology of anæsthetics Dr. A. J. Clark has been responsible. The physiology presents, perhaps, more change than any other section of the book. Dr. Clark has done his work admirably and all the changes are improvements. The headings are concise, clear, and numerous, so that the student can almost at a glance glean the most important items of knowledge in this part of the subject. The various theories of anæsthesia are lucidly discussed and Dr. Clark's verdict is that the "hypothesis that anæsthetics act by decreasing the permeability of cells appears to be much the most satisfactory explanation of anæsthesia."

The dangers of anoxæmia are explained according to the most recent physiological work, and shock is considered in the same light. Here we note that Hewitt's view of the condition and his division of shock into respiratory and circulatory are largely replaced by the recent appreciation of shock, primary and secondary, as being chiefly dependent on diminished volume of the circulating blood and poisoning by some histamine-resembling substance. Discussing the physiological action of ether Dr. Clark makes a statement, doubtless based on good evidence, which is contrary to the common belief. He says, "ether in no circumstances produces any direct stimulant action on the heart, but acts as a feeble cardiac depressant. This fact is of importance because hypodermic injections of ether are commonly reported to act as cardiac stimulants. Such injections act as general stimulants on account of the violent local irritation produced by the ether, and this irritation produces a rise of blood pressure as does stimulation of any sensory nerve." He adds that there is no evidence that ether has any direct stimulant action on the vaso-motor centre, but the asphyxia associated with many forms of ether administration produces a rise of blood pressure and the irritation of bronchi by ether also tends to produce excitement and a rise of blood pressure. When considering the action of nitrous oxide Dr. Clark utters a warning that should be taken to heart by all those of small experience who make use of "gas oxygen" for long operations. He points out that although this mixture is perfectly safe when properly given, yet the margin between the anæsthetic and the asphyxial concentration is so narrow that it is very easy for the inexperienced to produce asphyxial effects, which are, of course, extremely dangerous.

In the clinical portion of the book dealing with nitrous oxide a good description is given of the numerous forms of apparatus and of their use which have placed nitrous oxide and oxygen in major surgery on a footing very different from that which they held when the last edition of this book was issued. Nasal administration of these gases also and their intratracheal administration have demanded and received consideration. Nine pages are devoted to the intratracheal administration of ether, again dismissed in the last edition in a paragraph. Spinal anæsthesia is another subject which has been given fuller treatment. Good anatomical diagrams and drawings add to the value of this portion of the work, and the technique of the method is given in detail. Similarly the pages devoted to local and regional anæsthesia have been more than doubled. The combination of local anæsthetics with general anæsthetics does not appear to appeal to Dr. Robinson, who gives it little consideration. Splanchnic anæsthesia, doubtless advisedly, he does not mention. Mr. D. Cotes-Preedy contributes an admirable chapter on the medico-legal aspects of surgical anæsthesia, referred to in the front of this issue of THE LANCET. One omission, namely, the index of author's names, is, we think, to be deplored, but no doubt this was deemed necessary in order to keep the book of a convenient size.

The editor is to be congratulated on the manner in which he has maintained and enhanced the value of a fine text-book.

THE RESPIRATORY SYSTEM.

Traité de pathologie médicale et de thérapeutique appliquée. Appareil respiratoire. Tome I. Edited by ÉMILE SERGENT, L. RIBADEAU-DUMAS, and L. BABONNEIX. Paris: A. Maloine et Fils. 1922. Pp. 395. Fr.20.

THE present volume—one of a series of 32 publications covering the whole field of medical science—is concerned with the respiratory system. A 20-page introduction by Émile Sergent is an eloquent appeal to his colleagues to think, not merely "symptomatically," but also in terms of pathology, physics, and physiology. Such appeals are always timely, for though most of us pay lip worship to the study of primary causes, there is an inevitable tendency rather to tinker with symptoms than to investigate patiently the origins of disease. It is so much easier and more remunerative to prescribe a sedative for a cough than to trace it to one of a score or more of possible sources. The first chapter by Dr. D'Heucqueville on respiratory insufficiency is well illustrated, and the methods to adopt in re-educating children and adults in the neglected art of proper breathing are taught by

numerous drawings. There follows a chapter by Dr. Bellin on diseases of the upper respiratory tract. It is a little disappointing to find the subject of spasmodic rhinitis treated so cursorily and with so little reference to the important advances made of late in the study of this disease. Only a page and a half are devoted to acute pharyngitis. We know almost nothing of ætiological or therapeutic importance about this disease, and the author is honest enough not to conceal the gaps in his knowledge by the eloquence of ignorance. His honesty in this respect is still more apparent when he comes to the subject of chronic bronchitis. It is given less than a page. Most text-books on diseases of the respiratory tract devote many pages to this subject, and in the absence of exact knowledge we have no checks on flights of the imagination and the therapeutic claims of the symptomatologist. The section on diseases of the lungs contains chapters on congestion, œdema, pulmonary apoplexy, embolism, pneumonia, and gangrene. The best features of this work are its brevity of diction and orderly arrangement. It is not, and does not profess to be, an exhaustive treatise.

PHYSICAL THERAPY.

Die Praxis der Physikalischen Therapie. Second edition, enlarged. By Dr. A. LAQUEUR, Director of the Hydrotherapeutic Department of the Rudolf Virchow Hospital in Berlin. Berlin: Julius Springer. 1922. Pp. 360. M.384.

THE first edition of this book appeared in 1910. Notable advances in physical therapy have now necessitated the preparation of a second edition. It is not intended to give a complete account of all physical methods used in the treatment of disease; those methods described in special text-books, such as the technique of massage and medical gymnastics and X ray therapy, are only briefly mentioned, while orthopædic treatment is excluded. It has been the aim of the author to make the book essentially practical; but theory is also considered and the more important references to research work are given in foot-notes. The use of the mercury lamp and diathermy are the most important additions in this edition.

The book begins with a short description of the physiological effects produced by the external application of heat and cold and by hydrotherapy. There follows a detailed account of the technique which includes poultices, packs, baths, douches, sprays, hot-air baths, steam baths, Turkish baths, light baths, sand baths, mud baths, &c. All this is included under the heading hydrotherapy and thermotherapy. The next section on Balneotherapy includes CO_2 and oxygen baths, brine baths, sulphur, aromatic, and radioactive and electrical baths. A section on treatment by artificial light and sunlight is here included, and two short sections on massage and mechanotherapy and on treatment by high frequency, so-called "l'Arsonvalisation" complete the first part of the volume. In the second part the indications for treatment in different diseases are given in detail. Infectious fevers, diseases of joints, nervous and functional diseases, diseases of the circulatory, respiratory, and alimentary systems, metabolic diseases, syphilis and diseases of the skin, chronic intoxications and gynæcological disorders are all considered in this connexion.

The author gives a sensible presentation of the subject. This is shown particularly in the brief summaries he gives of opposing theories, and by his avoidance of the error of enthusiasm about physical methods of treatment. The description given of the mercury lamp in the treatment of rickets shows that the book is up to date. There seem to be but few omissions, although a short account of Krogh and Lindhard's work on the energy produced during treatment in the Bergonié chair might well have been included. The book is written from the point of view of a man applying these methods of treatment to patients in a large city hospital; the outlook is rather different from that of the spa physician, who, no doubt, would have devoted more space to the discussion of hydrology pure and simple. Balneology is fully considered, but the drinking of waters is hardly mentioned. Probably the author considered that this was outside the scope of his book. He does not always distinguish clearly between those diseases where physical treatment is of the greatest importance, and those other diseases where such methods are frequently used, but where there is not much evidence of their efficacy.

PROTISTS AND DISEASE.

Vegetable Protists, Algæ, and Fungi, including Chytridiineæ; Various Plassomyxineæ, the Causes of Molluscum Contagiosum, Small-pox, Syphilis, Cancer, and Hydrophobia; together with the Mycetozoa and Allied Groups. By J. JACKSON CLARKE, M.B., F.R.C.S. London: Baillière, Tindall and Cox. 1922. With 1 plate and 61 text figures. Pp. 229. 15*s*.

IT is nearly 30 years since the author put forward his well-known view that sporozoa, or organisms something like them, could be identified microscopically in and were the cause of a variety of tumours. As he tells us on the title-page, the present is the sixth book which he has published on the subject. The four preceding volumes appeared under the title of "Protozoa and Disease," which is now altered in accordance with the author's discovery that the bodies he has been studying are not protozoa but allied to the lower fungi, especially various members of the *Chytridiaceæ* such as *Olpidium*, parasitic in cabbages, *Polyphagus*, parasitic in the protozoon *Euglena* and *Synchytrium endobioticum* which causes wart disease in the potato. Mr. Jackson Clarke finds bodies which would pass for similar fungi in molluscum contagiosum, syphilis, cancer, vaccinia, &c. The difficulty of being sure, without some special revelation, that they are of this nature is the difficulty which attends all microscopic evidence taken by itself. Microscopic identity is not necessarily conclusive, microscopic similarity is suspicious, microscopic analogy is dangerous. Many of the appearances described and figured would be interpreted by some people as the results of cellular degeneration and phagocytosis; Dr. H. M. Woodcock would probably at once identify them as hæmatophagy; Mr. Jackson Clarke is by no means alone in judging them to be parasites. It will be well for the reader to keep the same open mind which the author has maintained through so many years of earnest non-conformity. It is not every worker who would cheerily tell the tale (p. 167) of how, with sporozoa on the brain, he was misled into showing the Pathological Society a section of an earthworm's seminal vesicle which had found its way, presumably from the razor, into a preparation of an adenoma of the cat's lip. It is an incident which must rank among the cautionary tales for microscopists with that of the cancer parasites which came from the cork of the bottle of immersion oil, or the potato which, as Bolles Lee tells, was golgified with such admirable results, or the trench-fever parasites from the distilled water.

PHYSIOLOGY AND BIOCHEMISTRY IN MODERN MEDICINE.

Fourth edition. By J. J. R. MACLEOD, M.B., Professor of Physiology in the University of Toronto. Assisted by ROY G. PEARCE, A. C. REDFIELD, and N. B. TAYLOR. London: Henry Kimpton. 1922. Pp. 992. 42*s*.

THIS excellent book passes through its editions at so rapid a rate that we must refer readers to the review in THE LANCET, 1921, i., 181, of the last edition for our opinions of its general excellence. The present edition is not greatly altered, but such alterations as have been made are welcome. In our last review we expressed the opinion that more matter should have been included concerning the interpretation of electro-cardiograms, and we are glad to note that the chapter dealing with that subject has been re-written on modern lines.

Other chapters which have been re-written are those dealing with the acid-base equilibrium of the blood, and of the emptying of the stomach, while considerable alterations have been made in the chapters on endocardiac pressure, the capillary circulation, adaptation to high altitudes, and, of course, pancreatic diabetes. With regard to the latter subject, there is a statement on p. 714, concerning the effects of "insulin" administration, which seems a little premature. The sentence reads: "The results shown in Fig. 190A justify the hope that when this extract . . . . is given subcutaneously for some time to diabetic patients, the pancreas may re-acquire its normal functions, or, at least, with control of the diet, may be restored sufficiently to effect a practical cure." We may venture the opinion that even if the hope is justified, expression of it was not; subsequent investigations in Prof. Macleod's laboratory have not borne out this statement up to the present, although they have put beyond question the efficacy of the extract in suspending the diabetic condition.

In our last review we expressed the hope that the day might not be far distant when candidates for higher degrees in medicine might be expected to show some regard for physiological applications to medical knowledge. The new regulations for medical degrees drawn up by the General Medical Council have since appeared, and we note that instruction in applied physiology is required in the curriculum for the future. Here is a text-book ready to hand, and we have no doubt that it will be widely adopted for this kind of physiological teaching of clinical students.

RADIOLOGY.

Radiodiagnostic dans la tuberculose pleuro-pulmonaire. By Dr. MANOEL DE ABREU. Paris: Masson et Cie. 1921. Pp. 168. Fr.15.

THE keynote of this book is its simplicity—the simplicity which comes with mastery of his subject by an author with an orderly mind. There are two classes to which the book should appeal. The first is represented by the budding radiologist anxious to master the elements of his specialty and to build his knowledge on the foundation of anatomy and physiology. The second class includes the many surgeons and physicians who, for various reasons, are unable to make an exhaustive study of the subject, but who object to being at the mercy of the specialist, and to accepting his opinions unchecked. Without some knowledge of radiology, the surgeon or physician who invokes the aid of the radiologist has to exercise more faith than is desirable. The numerous illustrations and descriptions thereof in this book should enable readers belonging to the second class to interpret the most common and definite X ray changes in the chest.

JOURNALS.

AMERICAN JOURNAL OF OPHTHALMOLOGY.—In the October issue the report of the Washington International Congress is continued. It includes an important paper by A. Magitot and Baillart of Paris on Blood Pressure in the Vessels of the Eye, and Magitot also has a separate paper in this number on the same subject. The way in which pulsation in the retinal vessels can be elicited and how the pressure on the eye-ball necessary to elicit it can be measured, the different significance of venous from arterial pulsation, the relation between them and the intra-ocular blood pressure, are all considered and clinical applications are suggested. One is the recognition of hypertension in the spinal fluid before the occurrence of choked disc. The vexed question of the relation between intra-ocular blood pressure and intra-ocular tension in glaucoma is also attacked.—The report of the Washington Congress also includes R. H. Elliot's paper on the diagnosis of glaucoma, by which there is understood more especially the diagnosis of incipient cases. No means should be neglected to make the diagnosis precise, and it should never be made on any one sign or symptom. Once incipient glaucoma has been definitely diagnosed operation should not be unduly postponed, a strong indication for operation being the recurrence of congestive attacks. One of the most delicate tests of such recurrences is the observation by the patient of halos round lights. At the same time it is necessary to define the nature of glaucomatous halos so as to distinguish them from other halos that are not glaucomatous. Of the two most important methods of early diagnosis—tonometric measurement of the tension and perimetric measurement of the field of vision—especial stress is laid by Elliot on the latter. Roenne's step, an enlargement of the blind spot where the scotoma is sharply bordered by a horizontal line in the neighbourhood of the fixation point, he says, is one of the most important signs; and if the question is asked why has it been so seldom observed, the answer is given, because so much of the perimetric work in consulting-rooms and other places is done against time, and sufficient trouble is not devoted to it. Moreover, to discover it it is necessary to employ the circular method of perimetry, which is often not done. When found it is a sign that some of the temporal fibres of the optic nerves—either those that leave the disc just above or just below its horizontal diameter—have been injured by excessive pressure against the unyielding sclera. Terminating, as they do, at the horizontal raphé of the retina, any lesion affecting them will cause loss of a portion of the central field of vision bounded by a horizontal line. A still earlier sign is the scotoma with jagged edges, which Elliot maintains is caused by the unequal injury to different nerve-bundles as they cross over the disc margin, but which he has only been able efficiently to demonstrate by the special scotometer devised by himself.

The number also contains a paper by G. F. Libby on Epidemic Encephalitis from the Standpoint of the Ophthalmologist. Notes on five illustrative cases are given.—In another paper D. F. Harbridge, after reviewing the current theories of sympathetic iridocyclitis, puts forward a new one. It is difficult to believe, he says, that the causative agent of sympathetic iridocyclitis is always resident in the sympathogenic eye alone. The fact that the sympathising eye is often more hardly hit than the sympathogenic forbids it. Yet this very fact leads us to consider a possible explanation in assuming that it is an anaphylactic reaction contributed to by infection from various focal points. In a case noted by him the infection, he supposes, proceeded from oral sepsis; the injury to the sympathogenic eye produced a soil suitable for the propagation and development of bacteria having an affinity for uveal tissue. During this process the injured eye acquired a certain degree of immunity, but when the toxicity had acquired the requisite strength the second (sympathising) eye was attacked, and, having previously acquired no immunity, suffered more than the one originally injured.

THE JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE for October contains the conclusion of Surg.-Commander W. K. B. Breton's article on Simple Mental Processes in Higher Gunnery Ratings, on which we comment elsewhere.—There is an interesting note by Surg. Lieut.-Commander G. D. Mackintosh on a Japanese Diving Appliance. It is a mask which covers the eyes and nose like motor-goggles, and is secured by indiarubber bands round the head, and by a projection held between the teeth. To the mask air is supplied from a compressed-air chamber and inhaled by the nose, exhaled by the mouth. Divers with this appliance can work more easily, ascend and descend more rapidly (even to 62 fathoms), and are said to be immune from caisson disease.—Degrees and diplomas gained by naval medical officers are recorded in this issue, along with honours recently conferred.—The retired pay of surgeon-commanders, who were on that list on July 1st, 1919, and who are ultimately retired compulsorily for age, will not be reduced below £547 10*s.*, the maximum formerly obtainable on compulsorily retirement at 55. This is an attempt to diminish the injustice done to these officers.

FRENCH SUPPLEMENT TO THE LANCET

Under the Editorial Direction of

Professor CHARLES ACHARD, PROFESSOR OF CLINICAL MEDICINE IN THE UNIVERSITY OF PARIS. AND Dr. CHARLES FLANDIN, D.S.O., CHEF DE CLINIQUE À LA FACULTÉ DE PARIS.

THE ANTI-COAGULATING PROPERTIES OF THE ARSENOBENZOLS.

THEIR CLINICAL APPLICATIONS: "EXO-HÆMOPHYLAXIS"—BLOOD TRANSFUSION.

BY CH. FLANDIN AND A. TZANCK.

WE were the first to make known the anti-coagulating action upon the blood of the arsenobenzols. This action shows itself *in vitro* and *in vivo*. *In vitro*, if the blood is collected in a glass recipient that is perfectly clean and sterile, the sides of which have been moistened with a weak arsenobenzol solution (arsenobenzol, novarsenobenzol, sulfarsenol, &c.) it will remain uncoagulable indefinitely. *In vivo:* When the blood is taken from an individual who has received an intravenous injection of an arsenobenzol, it will be observed that the coagulation of the blood is delayed, and that this delay will last from 30 minutes to 24 hours or longer. If the taking of samples of the blood is repeated, we may then perceive that the incoagulability continues for a period varying from several hours to several days. The phenomenon gradually passes off.

The action in checking coagulation, which the intravenous injection of an arsenobenzol produces, does not seem to depend upon the quantity injected, nor, in a certain measure, on the number of injections given to the patient. We say "in a certain measure," for it has seemed to us that with the patients who have received, in a series, a great number of intravenous arsenobenzol injections, the coagulation of the blood was specially delayed and this continued for a long time, for eight or more days.

The anti-coagulating effect is due absolutely to the arsenobenzol and has nothing to do with the syphilis. In fact, the same phenomenon occurs with those who are not suffering from syphilis. Also it exists, in a very high degree, with animals such as the dog, the guinea-pig, the rabbit—a fact confirmed by M. Launoy. The mechanism of the anti-coagulation has not yet been determined. All that we can say is that the arsenobenzols do not seem to act on the corpuscles or platelets of blood, which are not modified in form or number and which also are not agglutinated.

Without laying undue stress on the question, it is easy to understand the practical utility, for laboratory work, of a means of preventing the coagulation of blood. The adding of a very small quantity of an arsenobenzol does not modify the volume or the quality of the constituent elements of the blood. We have here an advantage over the usual citrated solutions. To obtain and to preserve the cells and the plasma, the use of arsenobenzol now seems to be the most simple and efficacious of means.

From the clinical point of view the innovation which we have introduced seems destined to bear fruitful results. Henceforth, when studying the time which the blood of a patient takes to coagulate, we shall have to consider whether he is under the influence of an arsenobenzol treatment before we conclude he is hypocoagulant. The surgeon or the accoucheur must be warned of the fact that arsenobenzol checks the coagulation of blood so that they may prevent its injection several days before operations or accouchements.

On the other hand, an arsenobenzol injection might have a good effect by permitting bleeding in certain conditions such as occur notably in cases of asphyxia, when the blood coagulates in the lumen even of a cut vein and prevents the flow. It may therefore be justifiable to resort to an intravenous injection of arsenobenzol to reduce or prevent the evolution of certain thrombotic processes. The two practical applications of our research, which we particularly desire to bring to light are, on the one hand, in connexion with what we term the "exo-hæmophylaxis," and on the other hand their relation to the transfusion of blood.

"Exo-hæmophylaxis" is the name we have given to a method for avoiding, in many cases, the sudden accidents that occur after an intravenous injection of arsenobenzol. We were inspired by facts brought forward by MM. Sicard and Paraf. These observers found that when a patient cannot tolerate arsenobenzol injections, the intravenous injection may be given before removing the bandage placed on the arm to cause the vein to swell, the contact of the injection with the blood in the isolated section of the vein often obviating accidents which might occur when, on removing the bandage, the mixture is propelled into the general current of the circulation. We conceived the idea that by bringing about the contact of the blood and the arsenobenzol outside the subject, that is, during a relatively long time, we would obtain a better display of the phenomenon observed by Sicard and Paraf. Being able to rely on the anti-coagulative action of the arsenobenzol we proceeded to test our theory. The method consists of diluting in 1 to 2 c.cm. of distilled water the quantity of novarsenobenzol or of sulfarsenol in a syringe holding 10 to 20 c.cm.; with this syringe 10 to 20 c.cm. of blood is taken. After waiting 5 to 15 minutes this mixture is reinjected either through a needle that has remained *in situ* or through a new puncture of the vein. In this way we reduced the sensitiveness of the blood outside the organism—exo-hæmophylaxis, and in 60 to 70 per cent. of the cases the accidents that might immediately result from intolerance were avoided, especially during a nitritoïd crisis. Our method, in principle and in practice, is entirely different from the proceeding empirically followed during many years by all those who have made intravenous injections and which consisted of drawing a little blood into the syringe before injecting, and of repeating this manœuvre several times, thus mixing the matter injected with the blood during the course of the injection. Our object was merely to provide a mixture and intimate contact during a period of time sufficient to ensure physico-chemical action leading to neutralisation of the toxicity of the arsenobenzol.

Seen under another aspect the exo-hæmophylaxis is a real auto-transfusion of blood. It is easy and convenient to use small quantities of the solution of the arsenobenzol to moisten the needle and the piston of the syringe employed for auto-hæmotherapy. There is no risk that the operation will be impeded by rapid coagulation of the blood.

The anti-coagulating action of the arsenobenzols enables us to realise two new methods of desensitisation to be placed by the side of autohæmo- and autosero-therapy—we allude to autoplasmotherapy and delayed autohæmotherapy. The names alone of these methods explain them. The terms are applied to subcutaneous, intramuscular, and intravenous injections.

When we had in this manner accomplished auto-transfusion of blood, we thought we might have recourse to the arsenobenzols for the transfusion of blood from man to man. To collect the blood of a healthy subject in a glass receptacle containing a small quantity of an arsenobenzol solution, to draw this from the receptacle with a glass syringe and re-inject it into the vein of the patient seemed extremely simple. It appeared to us that the addition of a little arsenobenzol to the blood of a donor was

a less inconvenient proceeding than that which required a large quantity of citrate of soda to prevent coagulation. This method is actually known in France as the Flandin-Tzanck method, and has been sufficiently employed to have established its reputation. It is now known as the most simple and the least dangerous method of transfusion of blood. Naturally it does not avoid the hæmolytic action or agglutination which often takes place between two subjects. It is therefore always necessary to study *in vitro* the reciprocal action of the blood of the person who gives and of the person about to receive, before the operation of transfusion is attempted. We would also call attention to the necessity of only employing glass or metal apparatus. Indiarubber sometimes prevents the anti-coagulation effect of arsenobenzols manifesting itself to full advantage.

In a word, the biological action of arsenobenzols in preventing the coagulation of blood, to which we have drawn special attention, has already enabled interesting practical applications to be made. It appeared to us that it would be useful to call the attention of our colleagues in England, who are interested in the French Supplement of THE LANCET, to these new facts.

PHYSIOLOGICAL STUDY OF THE PHENOMENA OF SHOCK:

(NITRITOÏD CRISIS) PRODUCED BY INTRAVENOUS INJECTIONS OF ARSENOBENZOLS.

BY DR. MARCEL POMARET,

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IN this study I propose to summarise the general results of the investigations on which I ground a purely physical conception of the initial mechanism of the "nitritoïd crisis" produced by intravenous injections of the different arsenobenzol compounds generally used in the therapeutics of syphilis. I will not discuss the well-known symptomatological character of this crisis, and propose to deal with the experimental phase of the subject. Therefore I will sum up the results of experiments made on dogs, as far as they enabled me to arrive at the mechanism of the crisis and to produce it experimentally.

As the result of a long series of experiments published elsewhere, and in relation to which I now only mention the principal conclusions, I have shown that arsenobenzol (606), when in aqueous non-alkalised, i.e., in acid solution, precipitates albumins in consequence of the presence of phenolic groups in its molecule. This precipitating power only disappears completely after hyperalkalinisation to a point nearly 60 per cent. above that calculated to produce neutrality, and at such a degree of alkalinity the solution cannot be practically employed. On the other hand, such compounds as type 914 (novarsenobenzol), while giving a neutral solution which still precipitates albumin, but much more feebly, can have the precipitating action intensified if the preparation containing the albumin is rendered acid by carbonic acid.

From the physico-chemical point of view the precipitates observed consist of a protein-arseno-phenolic adsorption complex[1] soluble in alkaline fluids. Its formation in a weak acid medium such as the carbonic acidity of blood depends on the phenolic group (OH) of the arseno- or novarseno-benzols by a mechanical action similar to the precipitation of albumin produced by the Esbach reagent or trinitrophenol.

These facts made manifest, my object was to establish the relation of cause to effect between the formation in blood, when an intravenous injection is practised, of the complex precipitate described and the appearance of the "nitritoïd crisis." In this latter, as in all vasculo-sanguine crises, there is but one major symptom which can be noted with precision by the physiologist, that is the decrease in blood pressure, an important and constant phenomenon which dominates all others (Lumière).

For these reasons and in the course of intravenous injections of the compounds here described, I have systematically recorded, during my experiments with dogs, the variations in the pressure of blood in the carotid, employing a graphic recording instrument for this purpose.

The nitritoïd crises produced by arsenobenzols I consider are the result of a phenolic shock; they are analogous to the fall of pressure registered after the intravenous injection of simple phenolic compounds such as trinitrophenol and ordinary phenol which precipitate the albumins like the arsenobenzols. Under the conditions in which I have always operated the question of chemical toxicity has never arisen, for I have never used toxic doses. The intensity of the shock and the decrease in blood pressure I was able to observe was more considerable in proportion as the solutions of phenolic compounds were more acid, and therefore had a greater precipitating effect on the albumins. The process *in vivo* of the nitritoïd crisis experimentally produced was therefore connected with a precipitation, or to speak more exactly, with the intravascular flocculation consequent on the formation of the adsorption complex described. The mere presence of this in the circulation is accompanied by the phenomena of anaphylactic shock, peptone shock, or the baryta shock described by A. Lumière. Its origin is purely physical (flocculation of the colloidal particles of serum) and does not originate with any chemical poison.

But the objection may be raised by this question: How does it happen that in man intravenous injections of arsenobenzols are rarely followed by a nitritoïd crisis? It is easy to answer this objection. As stated above, the precipitates (arseno-phenolic adsorption flocculi) are soluble in an alkaline medium; the blood is both basic by its bicarbonates and acid by its free acids, and therefore it acts, as we have said, by stimulating, on the one hand, the precipitating power of the phenolic groups of the arsenes and novarsenobenzols, thus bringing about intravascular precipitation, and, on the other hand, it renders soluble, with its alkali reserve (bicarbonate, &c.), the complex precipitate formed early in the *in vitro* process, and found to be soluble in a slightly alkali medium. Thus, if the blood has a normal alkaline reserve, the disturbance caused by the initial proteinic effect of the injection (the *colloidoclasis*, in a word, associated with flocculation) will be at once compensated by the solubility of the precipitate formed and the injection will not produce any appreciable physiological manifestation. On the other hand, if the proportion of the free acid in the blood is large, and if, in consequence of this fact, the alkali reserve is reduced, the intravascular precipitation, accompanying the injection, of the proteino-arseno-phenolic complex will be more considerable and more stable, for what at first was not soluble will, for a certain time, act as an insoluble foreign body, producing the phenomena of shock.

It will be seen, therefore, that this is an important accidental cause of the nitritoïd crisis. G. Milian and I have shown that, with patients habitually subject to this crisis, the diminution of the alkali reserve of the blood is considerable. Acting on this discovery, and so as to realise similar conditions in researches upon dogs and produce the hypotension crisis, I utilised acid solutions, either 606 or 914 (or Esbach's reagent). We ascertained also with a dog fed for a long time on a strictly flesh diet that after an acid injection of β-oxybutyric the intravenous injection of neutral novarsenobenzol produced a hypotension crisis of short duration.

By researches of a somewhat different nature I was able to demonstrate that subjects who could

[1] I have qualified these complex adsorption arseno-phenolic precipitates so as carefully to specify their mode of formation and their constitution. I would add that the solutions of phenolic compounds, or arsenobenzols, which I have injected in dogs, precipitated albumins in vitro, and a priori in vivo, and provoked no coagulation or embolism in the vessels, the flocculi formed being extremely finely divided.

not tolerate the arsenobenzols had secondary skin symptoms, being in a state of acidosis, as was shown by the high coefficient of acidity of their urine, which indicates quantitatively a reduction in the alkali reserve of the organism. It therefore became more and more evident, as the investigations in this direction progressed, that the humoral acidity created the intolerance to the arsenical compounds, whether this was an immediate intolerance—namely, a nitritoïd crisis—or a secondary manifestation (erythema). In fact it may be added that the more the solutions of arsenobenzol injected are acid the more serious are the phenomena of shock, which may become fatal [2] as a consequence of the sudden decrease of blood pressure and cardiac syncope.

Before I had investigated these questions many clinicians attributed the cause of the nitritoïd crisis to the presence, in the arsenobenzols employed, of a product that is 20 times more toxic, though the quantity would be very small (1 to 1·5 per cent.). This was arsenoxide or aminophenol arsenoxide $O=As-C_6H_3<^{CH}_{NH_2}$. To verify this I injected in the veins of dogs arsenoxide chlorhydrate, and I was able to show by the graphic record that this compound greatly increased the pressure, imparting to the graphic record the same sort of curves as those produced by adrenalin; this simple fact put it out of question with regard to the nitritoïd and hypotension crisis.

What practical conclusions can we derive from these experimental researches? Having ascertained the causes that give rise to the phenomena of shock, how will it be possible to avoid them or at least to attenuate their effect? Several means to this end have been proposed. Symptomatic therapy by the use of adrenalin is suggested by G. Milian, while J. A. Sicard proposes to render the flocculation soluble by dosage with alkali. W. Kopackzewski and R. Duhot, of Brussels, add sugar to the solutions of arsenobenzols. Finally we have the "exo-hemophylaxis" of Messrs. Flandin and Tzanck. I do not deal with these different processes in detail or their respective merits, but will be content with concluding here that my physiological and clinical investigations have convinced me that whatever method may be employed when giving intravenous injections of arsenical compounds we can never be quite certain of avoiding nitritoïd crises. The intravenous method is always accompanied by a risk of this description. On the other hand, I have been able to show that acid intravenous injections, though "colloidoclasic" and hypotensive in their effect, if given subcutaneously or intramuscularly produce no cardio-vascular action sufficiently marked to be recorded graphically.

The physiological facts being established, and it being admitted that the toxic effects of any substance is always less when injected into the muscle than into the vein, I undertook, with Prof. Jeanselme, the study of intramuscular injections of arsenical compounds.[3] This method I was able to demonstrate avoids the nitritoïd crisis and secures, with a minimum of noxious effects, a maximum therapeutic activity, because elimination is effected more slowly. The elimination is three times slower after an intramuscular injection than after an intravenous injection. This I was able to verify by the aid of Abelin's nitrogenous reagent modified by myself.

In returning to the study of the intramuscular method we were able to verify the exactness of the opinions held by English clinical observers who were the first to adopt this method, notably L. W. Harrison and L. G. Leonard. But, to simplify the method and ensure its more general use, we have made experimental and clinical observations with the active principle of 606 or of amino-arseno-phenol [4] stabilised in an alkaline organic medium now called *Eparseno*. This preparation is a solution sterilised by heat and preserved in ampullæ, whose contents can be injected in variable doses direct into the muscle. It is easily tolerated, there is no local reaction, and the therapeutic and serological results are at least as good as if not superior to those obtained by intravenous injections. The clinical use of Eparseno was started at the Hôpital St. Louis [5] eighteen months ago, especially with the patients who were not able to support intravenous injections. It was shown that the intramuscular method avoided the causative hematic disorders of the nitritoïd crisis. It was found to be the best method of employing the compounds of arsenic, and with suitable preparations such as "Eparseno" the maximum therapeutic action was obtained with the minimum inconvenience.

In a word, taking blood pressure as the physiological test of the nitritoïd crisis, we have the right to conclude that it is a variety of phenolic shock, since the same symptoms are observed in the use of trinitrophenol and phenol, as can be noted by superimposition of graphic tracings. In the light of these experimental facts we may finally conclude that the "nitritoïd crisis" only occurs in consequence of a physical process and are not due to phenomena caused by chemical toxins originating from the arsenic of the arsenobenzol molecule. The surest method of avoiding nitritoïd crises is to administer arsenic compounds by means of intramuscular injections.

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THE TREATMENT OF SYPHILIS BY INTRAMUSCULAR INJECTIONS OF AMINO-ARSENOPHENOL (POMARET'S 132).

BY MARCEL BLOCH.

THE method of treatment for syphilis studied in the service of Prof. Jeanselme with Dr. Pomaret is based on two principles that differ radically from the arsenical therapy which has been generally employed during recent years. These principles are: first, the systematic use of the intramuscular route; secondly, the employment of amino-arsenophenol. These two principles are the result of parallel researches made, first, on the mode of action and the elimination of drugs in general when introduced by intramuscular injections, and on the mode of action of arsenobenzines introduced by intravenous injections (phenomena of shock). Dr. Pomaret has set out above

[2] In fatal cases I found the coefficient of acidosis very high. It amounted to 18 per cent. though the normal is 6 per cent.

[3] Thus the soluble salts of bismuth, such as tartrobismuthate, or luatol, can only be used for intramuscular injections. If injected into a vein, the toxic action of the soluble salts of bismuth would act upon the bulbar centres.

[4] Prof. E. Jeanselme and M. Pomaret: Experimental Researches into a New Organo-Arsenical Preparation for Injection into Muscle, Academy of Medicine, Nov. 2nd, 1921. M. Pomaret: Experimental Basis of Arsenotherapeutics of Syphilis by Intramuscular Injections, Presse Médicale, Feb. 11th, 1922.

[5] General therapeutic results obtained with amino-arsenophenol (132) in the treatment of syphilis by intramuscular injections (paper read at the French Society for the Study of Syphilis and Dermatology on April 6th, 1922, E. Jeanselme). M. Pomaret and Marcel Bloch: Amino-Arseno-Phenol (132) in the Treatment of Syphilis by Intramuscular Injections, Presse Médicale, No. 37, May 10th, 1922.

his observations on the phenomena of shock experimentally produced, and the discoveries that led him to resort to the 132 preparation, or amino-arsenophenol, the base of 606. For our part our observations on the utilisation of quite different therapeutic agents (animal serums, antidiphtheritic, meningococcic, dysenteric, &c.) led us to prefer intramuscular injection rather than subcutaneous injection, where the absorption took too much time; or the intravenous injection which may, with animal serums, produce shock due to a physico-chemical action indistinguishable from arsenophenolic shock.

Therefore, when Dr. Pomaret placed at our disposal some amino-arsenophenol (132), we found in our possession a substance with the desiderata which we had suggested as necessary for an ideal treatment. We had:—1. A substance which we could inject into the body of a muscle without producing a caustic effect on the histological elements, a fact which assures the absence of pain and the complete absorption of the medicament, without risking the production of the phenomenon of shock. 2. A substance whose toxicity is reduced while its parasiticidal effect is increased as much as possible, leaving the organism undisturbed. 3. A preparation which largely simplified the therapeutic technique, and assured great stability; for the drug can be supplied to the practitioner in a liquid form ready to be injected in sealed ampullæ sterilised by heat.

We will now deal briefly with the therapeutic results we have obtained.

1. *Technique.*—The amino-arsenophenol, or liquid Eparseno, is a brownish-yellow fluid in a sealed ampoule sterilised by heat; it contains, per cubic centimetre of solution, 0·12 g. of amino-arsenophenol, which, in proportion to the quantity of arsenic, corresponds to 0·25 g. of novarsenobenzol. The injection is given with needles of the kind that are used with grey calomel oil and are used for intramuscular injections at the usual selected sites. As a rule, 1 c.cm. of solution (corresponding to 0·12 g. of amino-arsenophenol) is injected every two or three days—that is to say, $0{\cdot}12 \times 3 = 0{\cdot}36$ g. in six or nine days, which corresponds to $0{\cdot}75$ g. $(0{\cdot}25 \times 3)$ of novarsenobenzol (certain authors—A. Sezary—prefer to inject every week a single dose of 2 to 3 c.cm. of solution).

Results in Primary Syphilis.

It is first necessary to remark that the dose usually employed corresponds, during the first week of treatment, to a larger dose of arsenic than that given in the intravenous treatment.

Action on the Treponema.—Generally its disappearance is brought about in four days, if a dose of 0·24 g. of amino-arsenophenol is given. In some cases one single injection of 0·12 g. has sufficed. It is quite exceptional if any treponemata remain after seven days.

Action on the Chancre.—With four to five injections the average time for healing is nine days.

First Period of Treatment.—During the first period we injected on an average a total dose of 2·36 g. of amino-arsenophenol (132)—that is, 20 ampullæ of 1 c.cm. in 40 days, which is equal in arsenic to 4·72 g. novarsenobenzol.

Action on the Bordet-Wassermann Reaction.—The reaction has decidedly become negative at the completion of the treatment or has not become positive, if it was negative at the beginning of the treatment.

Action on the General Conditions.—An increase of weight has been constant. After eight months' observation, though some of our patients only underwent a short period of treatment, still they showed no symptoms of relapse. One of them had a new chancre which Dr. L. Brocq considered to be due to re-infection.

Results in Secondary Syphilis.

Action on the Treponema.—In the simple mucous plaque the treponema has disappeared on an average in four days with the administration of 0·24 g. of 132.

Action on the Lesions.—As a rule the roseola disappears after two or three injections, often after Herxheimer's exacerbation. The papillary roseolæ and the mucous plaques disappear in 8 to 18 days from the commencement of the treatment. The same may be said of ulcerated surfaces (*précoce syphilis maligne*) and the healing is rapid. A case of facial paralysis with double auditory paralysis occurring with a roseolate rash was cured in 20 days.

Dosage and Effect on Bordet-Wassermann Reaction.

In general the cure is effected by 24 injections of 0·12 g. in 55 days, and with negative Wassermann result. Patients have undergone a consolidation treatment as with other arsenical preparations. A case of mucous plaque that did not yield to novarsenol in strong doses was healed after six injections. On the other hand, another patient who had not benefited by other anti-syphilitic treatments also resisted the effects of 132.

Latent Secondary Syphilis.—We have brought about consolidation cures that were negative in regard to the Bordet reaction, positive with patients who had no apparent accidents.

Tertiary Syphilis.

Deep lesions (gumma, ulceration) have been healed on an average in 15 to 20 days.

Treatment of Late Nervous Syphilitic Conditions.

132 is very well tolerated in cases of tabes and general paralysis. It has a good influence in cases of tabes; but, it must be clearly understood, its effects are not reliable in cases of general paralyses.

Treatment when Intravenous Injections are Not Tolerated.

This is one of the most important points in our work. Where the intolerance is not great—a temporary febrile reaction after novarsenobenzol intravenous injections—patients support 132 without any rise in temperature.

Several patients who had acute, generalised, and immediate eruptions after small intravenous doses of novarsenobenzol supported the 132 treatment without inconvenience. On the other hand, certain patients with exfoliating erythrodermas had the same accidents after treatment with 132. These were cases of hepatic insufficiency with over-acidity who could not even endure cacodylate or Fowler's solution. Cases of cardiac affections and of tuberculosis have borne the treatment without bad effects when they could not endure intravenous injections. The same may be said of certain cases of albuminuria, though here other cases have found 132 no more tolerable than the other forms of arsenic.

It is in cases of the nitritoïd crisis following each intravenous injection that the 132, when injected into the muscle, has given the best results. The patients have never had any crisis even when no adrenalin was employed.

Conclusion.

The therapeutic trials made with amino-arsenophenol (132, Pomaret), or eparseno, prove that by intramuscular injections a sufficient quantity of arsenic can be given to be efficient. While avoiding the phenomena of shock, this method ensures a rapid absorption of the medicament, followed by a slow but sufficient elimination, avoiding the effects of accumulation (in the first sample of urine collected after an intramuscular injection the presence of the medicament is revealed by the nitrogenous reaction).

2. It is also possible to employ 132 with intramuscular injections for the vigorous treatment of recent syphilis, by giving during the first weeks larger doses than would have been possible with intravenous injections.

3. Those who cannot support the intravenous treatment endure this method very readily. Nevertheless, it is necessary to verify, as is the case with all active treatment, whether the patient's renal and hepatic strength is sufficient or whether he is unable to endure even a very feeble dose of arsenic.

4. For the prolonged treatment of old cases of syphilis, nervous syphilis, &c., the easy technique is a special advantage of 132.

THE LANCET.

LONDON: SATURDAY, DECEMBER 2, 1922.

Organic Arsenical Preparations.

THE distances which separate scientific observers working in different countries are further enhanced if, in addition to the geographical barrier which divides them, there are imposed the further obstacles of language, with the attendant one of lack of common literature. In consequence of this, the trend of investigations originating from a common point, and of the trains of thought resulting from the investigations, tend to become more and more divergent; new ideas are expressed in fresh terminology, and thus in time workers in one country are in danger of not understanding the views expressed by those in another. This state of things exists to some extent between workers in Great Britain and those on the Continent with regard to the investigation of organic arsenical preparations of the salvarsan class, and hence we have pleasure in printing in the French Supplement to our present issue a series of three related papers on this subject by eminent French authorities, in the belief that their results will be of the greatest value to our own investigators. In this country efforts have been directed chiefly along the lines of purification and standardisation of the various preparations, such efforts being always in close touch with clinical requirements. Various impurities have been isolated from commercial salvarsan, and have been chemically described.[1] The testing of the toxicity of salvarsan preparations on behalf of the Board of Trade has been carried out at the National Institute for Medical Research,[2] and comparative laboratory tests of the therapeutic efficacy of the various preparations, based on the curative power for mice infected with *Trypanosoma equiperdum*, have also been made. The results of these researches give good hopes that both the clinical toxicity and the therapeutic value of the drugs in the treatment of syphilis may be determined by simple laboratory tests.

In France, in addition to investigations of a similar nature to those in which our own workers are engaged, and which have, on the whole, yielded very similar results, a good deal of work has been devoted to the study of the physiological effects of administrations of the various arsenical preparations, and it is with such results that the articles which we now publish mainly deal. In the first article Dr. CHARLES FLANDIN and Dr. A. TZANCK show that the addition of an arsenobenzol to the blood, either *in vivo* or *in vitro*, leads to a delayed coagulation time, or may even inhibit clotting altogether. Some technical possibilities arise out of this, the most interesting being the suggestion that a small addition of an arsenobenzol to the blood of the donor may be the best way of avoiding the accidents due to clotting in blood transfusion. Although it is a common practice in this country to dispense with additions of citrate, and to transfuse the blood before it has had time to coagulate, this method would appear to have as many drawbacks as the citrate method. A small addition of an arsenobenzol would seem to overcome the difficulties without introducing those attendant on the use of the admittedly toxic citrate, and would have the further advantage of absolutely excluding the danger of the recipient contracting syphilis from an unrecognised syphilitic donor. A further application of the fact of delayed coagulability is seen in a procedure called by the authors "exo-hæmophylaxis"; by allowing the arsenobenzol to react with some of the subject's blood for several minutes *in vitro*—a procedure which the delayed coagulability makes possible—the blood changes which are the underlying cause of the accidents of salvarsan administration take place outside the body, so that the subject can tolerate the injection readily. While we do not much like the term "exo-hæmophylaxis," for reasons which will appear later, the method seems worthy of trial.

In the second of the papers Dr. MARCEL POMARET deals with the shock-like effects seen after intravenous injections of the arsenobenzol compounds. These effects are liable to be greater after previous treatment with the same drug, and thus to resemble anaphylactic shock more or less closely,[3] though not fatal. It is customary in France, and far from unknown in this country, for all conditions of collapse rapidly supervening and accompanied by a fall of blood pressure to be called "shock"; this we think to be a mistake, because physiologically there may be no resemblance, except perhaps just before exitus, to the condition of surgical shock, with which the name tends to confuse these conditions. It is even less desirable in our opinion to describe these phenomena following subsequent injections of salvarsan preparations as "anaphylactic shock," which is a definite physiological entity. We would prefer the term "anaphylactoid phenomenon" if it is desired to express some superficial resemblance between this phenomenon and that seen in true anaphylactic shock, but feel sure that the resemblance is nothing more than superficial. For instance, it has been shown that salvarsan has almost no action on the bronchial musculature, but does produce a rise in the pulmonary arterial pressure, unless injected into the portal vein, when, owing to precipitation of the drug in the vessels of the liver, there is little, if any, effect on the pulmonary pressure.[4] The rise of pulmonary and fall of systemic pressure would therefore in all probability be due to pulmonary obstruction. Now, numerous researches, carried out for the most part in France, have indicated that a depression of the blood pressure follows when fine colloidal precipitates are thrown down in the blood-stream—e.g., when phenols are injected intravenously, or when barium sulphate suspensions are injected. The phenomena so produced are called "phenolic shock" and "barium shock," though here, again, the exact cause of the fall of blood pressure remains obscure. But it is most interesting to note that Dr. POMARET finds that the shock-like effects of the arsenical organic preparations are related to their facility for precipitating proteins; in general, the more acid the preparation injected the greater the ease with which a complex colloidal adsorption precipitate is produced, and the greater the depressor effect of the drug. Such effects are called "colloidoclastic," and phenolic shock is one type of such effect, and the "nitritoïd crisis" following arsenical administration is another. This name

[1] H. King: Derivatives of Sulphur in Commercial Salvarsan, Jour. Chem. Soc., 1921, cxix., 1107 and 1415.

[2] Under the direction of Dr. H. H. Dale, by J. H. Burn, Miss Durham, and Miss Marshal. See Report of the Medical Research Council for 1920–21, p. 23.

[3] Flandin and Tzanck: Compt. Rend. Soc. Biol., 1921, lxxxv., 993.

[4] Jackson and Raap: Jour. Lab. and Clin. Med., 1920, vi., 1; M. I. Smith: Jour. Pharm. Exp. Therap., 1920, xv., 279.

"nitritoïd crisis" is, in our opinion, the better one to use, since it avoids any confusion with either shock or anaphylaxis. If it be a fact that the crises are due to the production of fine colloidal flocculi in the blood plasma, then it follows that any condition which reduces flocculation will diminish the severity of the crises. Such a condition is an augmented alkalinity of the blood. The reaction of the blood depends on the balance between the plasma bicarbonate and the free carbonic acid,[5] so that increase of the former or reduction of the latter should reduce the tendency to crises. Conversely, the author has actually shown that when the alkalinity of the blood is much reduced—i.e., when the plasma bicarbonate (alkali reserve) is lowered—the nitritoïd crisis is much more easily provoked. A further point of great interest in Dr. POMARET'S paper is his evidence that "arsenoxide," when present as an impurity, cannot be responsible for the crises; similar conclusions have been reached in America by REID HUNT,[6] who thinks that the toxic effects are due rather to some physical conditions in the solution, a conclusion that is not fundamentally different from that of Dr. POMARET.

The practical derivations from Dr. POMARET'S paper will, we think, find many supporters in this country. He recommends intramuscular injection, and for this purpose advises the use of the preparation called "Eparseno." The employment of this drug, and some results obtained by its use, are described in the third paper by Dr. MARCEL BLOCK. It would appear from his description that the intramuscular injection is almost painless, which removes the chief objection to administrations by this route.

Justifiable Fœticide.

THE question of the right of the medical adviser to determine whether he shall or shall not carry out an operation, which may result in the death of the fœtus in utero, in the hope of saving the life of the mother, is one which has excited controversy in all ages. Among the Romans the right of life or death belonged to the father of the family, and he could exercise it in the case both of his wife and of his children. This power, however, was given to him only for the purpose of punishment, and obviously he could have no such authority in the case of an unborn child, which could not have been guilty of any crime. At the present day the father has no such right, but even now it is not uncommon to meet with parents who believe that such a law exists and that it is within the province of the father to decide whether or no the life of his unborn child may be sacrificed. If it is admitted, as it must be, that the father has no such power, what is the position of the mother in a question which may so vitally affect the preservation of her own life? There are many who would lay it down that the right of decision can only be exercised by the mother. Those who maintain this view found their argument upon the universal law that everyone has the legal right to do anything that may be necessary to preserve his or her own life, and, therefore, that the mother must of necessity be the only judge in the matter and that she alone can decide whether or no the life of her unborn child is to be sacrificed in order to preserve her own. At the same time if this view is to be acted upon it must be regarded as a measure of defence and be exercised solely to safeguard the mother from the immediate risk of death if the life of the child is not taken. If, as NAEGELE says, the mother has the right of deciding and demanding that her infant shall be killed, can the medical practitioner legally carry out her demands? Inasmuch as his first duty is to come to the succour of his patient and to safeguard her by all means in his power, it must be admitted that he is justified, if need be, in killing the unborn child.

It seems, then, that the doctor in certain and possible circumstances has not only the right but is under an obligation to kill the child if thereby he can more certainly safeguard the life of the mother, and this is the teaching prevalent among jurists and physicians at the present day. Legally the mother has the right to decide whether she will or will not run any undue risk for the sake of her unborn child, and she can legally decide to do one or other of these two things, even against the wishes of her husband. The legal position of the unborn child is still unsettled. It is part of its mother, and has no legal existence apart, until such time as the cord is cut; the mother can recover damages for its loss by negligent or wilful means; but the child has no legal redress for any injury it may sustain, even if it survive its birth. A decision as to the legality of fœticide is most commonly required in dealing with cases of contracted pelvis, in which it is impossible to deliver a living child by the natural passages, while the conditions are such as to render any operation other than craniotomy a procedure of great danger to the mother. Happily such cases occur less and less frequently, and we may confidently expect that they will become even more unusual in the future. The careful safeguarding of the mother during her pregnancy, the early recognition of cases of contracted pelvis, and the carrying out of the various measures for dealing with such cases available at the present day, accompanied as they are with but little danger to the life of the mother, should render craniotomy of the living child an operation of the greatest rarity. At the same time cases inevitably will occur from time to time in obstetric practice in which, for a variety of reasons, it may have been impossible to take the steps necessary to safeguard the mother from all the possible accidents of childbirth, and in such conditions craniotomy even of the living child may have to be decided upon, repugnant as it must be to everyone concerned.

There is, however, another side to the difficult decision of the value of the life of the mother in comparison with that of the child, and this arises in cases in which certain operations are practised in the hope of saving the child's life at some corresponding increase to the risk the mother runs. The best modern example of this is the tendency to practise the operation of Cæsarean section in the treatment of cases of placenta prævia. By the operative procedures generally adopted the risk to the mother in a case of placenta prævia is a very definite but small one; the risk to the life of the child is very large. Is the obstetrician justified in practising an operation such as Cæsarean section, chosen mainly for its influence in diminishing the risk to the life of the fœtus, with a possible and, according to the experience of the majority of operators, a certain increased risk to the life of the mother? In the modern developments of obstetric surgery the opposite side of the picture calls for inspection and consideration. Is the medical man justified in increasing the risk to the child in an endeavour to diminish the suffering inflicted upon the mother, as, for example, in the practice of twilight sleep, or in the performance of version followed by the rapid delivery of the mother in the majority of cases of labour as a routine means of delivery? In this country at any rate we think the conscientious

[5] C. L. Evans: THE LANCET, 1921, ii., 867.
[6] Reid Hunt: Jour. Amer. Med. Assoc., 1921, lxxvi., 854.

practitioner will have little difficulty in answering these questions: he will endeavour to maintain a happy mean. If an occasion arises when the interests of the mother and child must be weighed in the balance, he will regard the life of the mother as of greater value than that of her unborn child. Any decision he may come to as to the proper course to pursue will be founded upon this "Golden Rule."

The Lausanne Conference and Public Health Work in the Near East.

THE Peace Conference at Lausanne, and the terms of the Peace Treaty which that Conference is expected to produce, will have a far-reaching effect on much of the medical and public health work undertaken in the Near East. This is particularly the case in regard to the port sanitary and quarantine work which used to be carried out by the Constantinople Superior Board of Health in all the Ottoman ports of the Black and Ægean Seas, as well as on the Arabian coast, in the Persian Gulf, and in connexion with the safeguarding of the Mecca pilgrimage from infection. One of the most pressing problems before the Lausanne Conference will be the interpretation of the meaning to be attached to that much-used phrase, "Freedom of the Straits," and its relation to the prevention of spread of disease by ships. Under the conditions which obtain at present, and which are likely to continue for a long time, the whole of the littoral of the Black Sea presents an active danger to shipping on account of the prevalence of cholera, plague, small-pox, and other serious epidemic diseases which have accompanied the military and political vicissitudes of Asia Minor. It is greatly to the credit of the Inter-Allied Sanitary Commission, which has had temporary charge of preventive measures at Constantinople, that during the past two or three years it has succeeded so well in applying judicious measures of observation and quarantine to ships coming from the infected areas, and in this way has secured to Europe a very substantial protection against the importation of infection. Evidently from a public health point of view it is of great importance that this work should be continued and carried out efficiently by whatever authority succeeds the Inter-Allied Sanitary Commission in the public health control of the Straits. This question was reviewed in some detail by the expert medical commission of the League of Nations in its report of April last,[1] which strongly recommended that a properly equipped and efficient sanitary organisation of an international character should be established in these waters. In the opinion of that commission, such a body is called for, not only on account of the very special epidemic situation, but also because of the essentially international character of the traffic in the Straits, and the numerous nationalities which are directly or indirectly concerned with its shipping.

The same question was fully discussed last month in Paris by the Office International d'Hygiène Publique in connexion with revisions which are being proposed by that office in the general International Sanitary Convention. The official delegates from the Government public health services of all the countries represented, including the United States, unanimously expressed the opinion that special measures should be prescribed, by an international sanitary authority, for arrivals from the Black Sea; measures analogous to those contemplated in Part II. of the International Sanitary Convention, 1912. In other words, it is recommended that ships from infected Black Sea ports should, in their passage through the Bosphorus and Dardanelles, be subject to a system of surveillance and observation comparable to that which for so many years has been exercised, with very satisfactory results, in the Suez Canal in the case of vessels travelling to Europe from infected ports in the Middle and Far East. It is to be hoped that in the interests of public health these very weighty and authoritative recommendations will be pressed by the Allied Powers and adopted in the Treaty. Precisely similar considerations apply to other recommendations made at the same session of the Office International d'Hygiène Publique. That body advised all the governments represented that it is essential in connexion with the Mecca pilgrimage to establish a satisfactory quarantine and observation station on the Hedjaz railway, as near as practical conditions permit to the sacred cities, and also that official measures should be prescribed by which the operations of the different sea and land quarantine stations dealing with the pilgrims can be effectively coördinated. It would appear that while some of these measures call for settlement in the new treaty of peace with Turkey, others can be included in the next edition of the International Sanitary Convention, the revision of which is already greatly overdue. We are glad to learn that the Office International d'Hygiène Publique has completed a detailed draft revision of the existing Convention of 1912, and that its proposals will shortly be circulated by the French Government to the signatory powers with an invitation to an International Sanitary Conference at which the exact terms of the new document can be finally settled.

[1] THE LANCET, 1922, i., 858.

A CONFESSIONAL OF DIAGNOSTIC AND THERAPEUTIC ERRORS.

THE debate at the next meeting of the Section of Surgery of the Royal Society of Medicine, to be held on Wednesday next, Dec. 6th, at 5.30 P.M., promises to be one of unusual interest and is of a novel character. The President, Members of the Council, and many other well-known surgeons will each relate one mistake in diagnosis or treatment which has occurred to him personally, with the lesson that may be drawn from it. The immense value that accounts of such errors may be to the less experienced members of the profession is well brought out by Prof. J. Schwalbe, of Berlin, in a foreword to a series of books with the general title Diagnostische und Therapeutische Irrtümer und deren Verhütung,[1] of which he is the general editor. He found no difficulty in persuading distinguished men to contribute to the series, in fact, received active and enthusiastic support for his scheme. Several volumes have already appeared and bear out Prof Schwalbe's prophecy that such unsystematic teaching may have attractions denied to formal lectures. Details of the cases described at the Royal Society of Medicine will not, however, be published, so that those who wish to have the benefit of the experience of their seniors or colleagues must attend the meeting. Surgeons wishing to take part in the debate by relating instructive mistakes of their own are requested to communicate with Mr. Philip Turner, the junior secretary.

[1] Leipzig: George Thieme. 1922.

Annotations.

"Ne quid nimis."

THORACOSCOPY.

THERE was a large gathering at the Royal Society of Medicine on Nov. 22nd to hear Prof. H. C. Jacobaeus of Stockholm lecture on the cauterisation of intrapleural adhesions. He mentioned that it was in the same room that he first described his methods 11 years ago. His work in Stockholm since then is well known to all who are interested in diseases of the chest, and opportunity was welcomed of asking questions and discussing some of the interesting points arising out of his work. Originally Prof. Jacobaeus used a form of cystoscope in cases of ascites to examine the abdominal viscera, and he found it a useful aid to diagnosis. Later he used a similar instrument, called a thoracoscope, to examine the thoracic viscera in cases of pneumothorax. By this means he is not only able to see pleural adhesions, but by introducing into the pleural cavity a galvano-cautery to cauterise those which are preventing a satisfactory collapse of the lung. The technique of this procedure has been fully described elsewhere,[1] and we need not describe it again here. The importance of this method lies in the fact that it enables the physician to treat by artificial pneumothorax many patients hitherto unsuitable owing to the presence of adhesions. The object of pneumothorax treatment is to collapse and thus rest the diseased lung. It is quite obvious that if the lung cannot be collapsed sufficiently to rest the diseased part the patient cannot receive true pneumothorax treatment. Prof. Jacobaeus illustrated his lecture with excellent skiagrams showing the lung partially collapsed but held here and there to the chest wall by adhesions before treatment, and showing the same case after treatment with the lung completely collapsed. He also showed skiagrams to illustrate cases where there was adherent pleura, parts of the lung being held in contact with the chest wall. In these cases it is impossible to free the lungs and allow it to collapse. He gave a short account of each case illustrated, and the immediate improvement in the condition of the patient after successful cauterisation of the adhesions was remarkable. In those cases, however, where the adhesions could not be cauterised there was no improvement, but the patient suffered no ill-effect. Finally, Prof. Jacobaeus described a few cases of intrathoracic tumour in which he had defined the position of the tumour by means of the thoracoscope. In some of these cases the tumour had been removed by operation, and the skiagrams showing these cases before and after operation were most striking.

The lecture was delivered in English, of which language Prof. Jacobaeus has complete mastery. On the following day he visited the Brompton Hospital and demonstrated the cauterisation of pleural adhesions. Those who were present were able to see through the thoracoscope the lung and adhesions before, during, and after the cauterisation, and were impressed by the ease and swiftness with which the operation was performed. It may be hoped that the visit of Prof. Jacobaeus will draw the attention of the medical profession to further possibilities of treatment in intrathoracic disease and will stimulate researches in this important branch of medicine.

THE GUNNER'S REACTION TIME.

IN the *Journal of the R.N.M.S.* for October Surg.-Commander W. K. D. Breton concludes his account of simple mental processes as applied to higher gunnery "ratings"—i.e., ranks. He tells of the psychological tests he made to find out which of the men in the gunnery school were most likely to be of value, most likely to be worth training as gun and director-layers, by recording their powers of observation, their alertness and judgment, and the swiftness of their reaction to stimuli. These higher ratings are the men who aim and fire the guns in accordance with the directions that they receive from the transmitting station, where, in the best sheltered part of the ship, there sits an officer receiving information from the observers above, who tell him the course and speed of his own ship and of the target-ship, give him the rangetakers' range and its variation, and warn him of changes in the wind and the weather. All these variables this officer and his staff are constantly coördinating, and the result, with the captain's orders, he passes on to the turret-directors and gun-layers. "It should not be difficult," Dr. Breton writes, "to gauge the strain of such a duty," which can have, during action, no rest short of relief—i.e., replacement. The human element, its alertness and endurance, may exercise great influence on the winning of a battle. To help in selecting the best men, Dr. Breton has been measuring the period they took to report certain signals. That most quickly acknowledged was a single sound signal (0·33 sec.); a single coloured lamp (0·34 sec.) came next, then choice of two coloured lamps (0·48 sec.), choice of two sound signals (0·58 sec.), and lastly selection between four which took longer still (0·65 sec.). Of 350 men examined, of whom about 90 per cent. were under 30, he classifies 270 as temperate, 65 as teetotallers, and from amongst them he selects his best, the "deliberate" type, most of whom were good at games. "Briefly, every response (of the deliberate) is steady, and there is never any evidence of fluster. He rarely miskeys or hesitates before striking the right key." It is not that the simple reaction time of these men is specially low, but that their results are steadily about the mean with few extreme values.

HEALTHY SERVANTS FOR HEALTHY HOMES.

IN the *Bulletin* of the New York Tuberculosis Association (Sept. and Oct., 1922) there are two important papers concerned with the introduction of tuberculosis into healthy homes by domestics. In the first paper Dr. Charles H. Smith calls for a law requiring a domestic servant to show a health certificate at the time she applies for employment. In his own household he has made a point of examining medically all applicants for employment, and in the course of five years three prospective domestics were found to be suffering from active pulmonary tuberculosis. The evidence he has collected of the infection of children by servants was brought to the notice of the New York Tuberculosis Association, and the Statistical Research Service of this Association undertook to gather further information on this subject. The findings are dealt with in the second paper in the Association's *Bulletin*. Three questions were addressed to nearly 100 specialists in tuberculosis and child welfare. What was (1) their personal experience as to the prevalence of tuberculosis among servants; (2) their knowledge of children infected by servants; (3) their opinion on the two following suggestions: (*a*) "That health authorities and organisations undertake an educational campaign, advising those employing servants to require a medical examination before engaging them, and urging the importance of periodic re-examinations"; (*b*) "that the Sanitary Codes be amended to require examination of servants or persons caring for children, as is now required in New York City and certain other cities, of food handlers in public places"? Replies were received from 78 physicians, 46 of whom had found tuberculous servants in homes where there were children. Twenty of the physicians had experience of infection of children by servants. Comments on the suggested reforms were received from 63 physicians, 20 of whom were in favour of an educational campaign only among employers. The remaining 43 were in favour of an amendment of the Sanitary

[1] Jacobaeus, H. C. (1921): About the cauterisation of adhesions in pneumothorax treatment of tuberculosis, Acta Chir. Scand., lili., 293. Also Holmboe, W. (1919): Endopleural Operations in Pulmonary Tuberculosis by Jacobaeus's Method. Tubercle I., 1.

Codes or of such an amendment plus an educational campaign. Commenting on these answers, the author of this paper states that the best authorities appear to believe that only compulsory provision of health certificates by prospective servants can solve this difficulty. In other countries, also, the danger is attracting notice. In the draft of the new Swiss tuberculosis law there is a paragraph, chiefly devoted to the protection of the child, which provides for systematic medical inspection of persons engaged in the institutional care of children, and for the removal of tuberculous teachers and other persons concerned with the care of children. In the framing of the draft of the new Norwegian tuberculosis law consideration was given to the feasibility of requiring health certificates of servants and nurses applying for work connected with children. Ultimately it was decided not to incorporate this provision in the new law, but rather to rely on educational propaganda. Such a measure would no doubt prove a dead letter when the supply of domestic servants is less than the demand, and when the reverse is the case an ordinarily intelligent employer would take steps to secure a healthy servant for his children whatever the law on the matter may be. It is well to remember that this is a democratic age; the time may come when, in return for her own health certificate, a prospective domestic may require a clean bill of health from her prospective employers, and may refuse an engagement unless the master of the house can prove that he is Wassermann-negative as well as sputum-minus.

PLAGUE PREVENTION IN NORTH MANCHURIA.

THE North Manchurian Plague Prevention Service was established in October, 1912, with an annual grant of £90,000; it maintains out of the funds five hospitals at Harbin, Sansing, Taheiho, Lahasusu, and Manchouli; but owing to political troubles it has not been possible to adhere to the original plan of expanding the plague prevention service into a comprehensive public health organisation for the rest of the country. Compared to health organisations elsewhere the Manchurian Plague Prevention Service is indeed a modest one. After ten years' useful work, including the suppression of two big epidemics of plague and cholera, the annual appropriation is still an uncertain one; in fact, the Harbin Hospital shows signs of tumbling down and it is aptly pointed out that, at a time when China is in the vortex of political passions, a score or more of men and women are ready at great personal risk to remain on duty at a small remuneration One of this devoted band of workers, Dr. Yuan Teh Mao, died of plague on Feb. 21st, 1921. The third series of reports has just been published [1] and commemorates the tenth year of the existence of the Service. Some of the articles are original, the remainder are reprinted. Among numerous excellent illustrations one stands out especially—a really fine coloured plate of a lung in pneumonic plague, reproduced by the Commercial Press, Ltd., of Shanghai, a purely Chinese-managed concern.

The first portion of the volume deals with the second pneumonic plague epidemic in Manchuria 1920–21. For ten years since the great plague of 1910–11 Manchuria had been free, but in October, 1920, the wife of a Russian guard on the railway bridge at Hailow (117 miles from Manchouli) died of bubonic plague. This started the epidemic, which gradually evolved from the bubonic through the septicæmic to the pneumonic form—in Harbin the deaths totalled 3125. Eventually the infection reached Vladivostock, where the epidemic raged through the summer months of 1921 and caused 520 deaths. Altogether the 1920–21 epidemic claimed 9300 lives. Very valuable conclusions have been reached in this work. Mere drying of plague sputum is not a sufficient test for killing *B. pestis*; disinfectants and antiseptics, even in strengths usually recommended, have not always the desired effect upon plague sputum. The existence of plague carriers has been proved, and the cotton-and-gauze mask, when properly applied, is considered the best means of personal protection against infection by inhalation. Pigs and birds were found insusceptible to plague. There is no doubt that natural plague exists in the marmots or "tarabagans," but its practical importance in the origin and spread of plague is not yet established. Further information by investigation in the marmot regions is required. With experimental conditions this animal is easily susceptible to pneumonic plague. The volume contains much other information, some in a lighter vein, such as a description of the Temple of Medicine in Peking and an amusing account of a picture of a group of eunuchs in a Chinese imperial palace.

The Chinese medical service is fortunate in possessing in its director and chief medical officer, Dr. Wu Lien-teh, of whose energy there is abundant evidence in this volume before us.

[1] Reports 1918–1922. North Manchurian Plague Prevention Service. Edited by Wu Lien-teh, M.D., B.C. Cantab. Tientsin: Tientsin Press. 1922. Pp. 354.

PSEUDO-BULBAR MANIFESTATIONS OF EPIDEMIC ENCEPHALITIS.

DURING a recent epidemic of chronic epidemic encephalitis at Rome, Profs. Bilancioni and Fumarola had an apportunity of studying some patients with laryngeal and respiratory complications.[1] Disturbances of laryngeal motility consisted generally of a certain degree of slowness in adduction and abduction of the vocal cords, and frequently of an incoördination of these movements. These phenomena, together with disturbances of the respiratory rhythm, occur at a period more or less remote from the acute manifestations of the disease, and are analogous to the paroxysmal dyspnœa and respiratory arrhythmia met with in advanced stages of glosso-labio-laryngeal paralysis. Ten patients with chronic epidemic encephalitis were seen by the authors. Disturbances of respiratory rhythm made their appearance at very variable stages of the disease, in some after a few weeks, in others after an interval of three to 13 months; they consisted in modifications of the form and frequency of respiration, and sometimes in the rapid passage from one to the other type, in an attack of rapid breathing more or less violent and more or less prolonged, or in intense dyspnœa. During sleep the respiration was often unequal, wavy, and slow; in other cases it was rapid and panting. In some cases the salient feature of the respiratory disturbance consisted in the want of a clear distinction between the inspiratory and expiratory phases or between upper thoracic and abdominal respiration. There were very characteristic sudden attacks in which respiration became in a moment deep and rapid, and sometimes entirely buccal, the nasal passages not being utilised. Another striking characteristic, as shown by examination of the respiratory tracings, was the tendency to prolongation of the respiratory phase, so that the rhythm became sighing and accompanied by a feeling of dyspnœa on the part of the patient, who brings into play the auxiliary muscles and retracts the lower lip into the mouth. Sometimes, in addition to prolonged expiration, there was a more or less brief pause between the two phases of the rhythm, and in one case inspiration was much longer than expiration. As regards the larynx, there was almost always a certain diminution of tonicity in the vocal cords and a tactile hypoæsthesia of the laryngeal vestibule. The exact pathological explanation of this disturbance of respiratory rhythm is difficult. The existence of some symptoms such as paresis of the cords, characteristic of a bulbar origin, might at first sight incline to admit a bulbar localisation of the post-encephalitic process. Even if this were admitted, it would not follow that the respiratory disturbances

[1] Annali di Medicina Navale e Coloniale, Rome, July–August, 1922.

were due to an organic bulbar lesion. Again, the modification of the symptoms during sleep, and the influence of suggestion and deviation of the attention noticed in some of the patients, are in favour of a functional or psychic origin, but it is, on the other hand, strange that the only hystero-organic association observed in epidemic encephalitis should be that of respiratory disturbances which are the reverse of frequent. The authors believe that an explanation can be found in the toxins circulating in the blood capable of disturbing the functions of the respiratory centre itself. This theory is very probable since, in the Parkinsonoid forms to which these cases belonged, the disease is not only present but in continuous evolution; if the phenomenon is rare with regard to the now numerous cases of encephalitis of prolonged course, it may depend on a greater individual lability of the respiratory centres in some cases, or on the special psychic condition of the subject.

SIXTY YEARS OF SURGERY.

A FEW weeks ago Mr. James Berry, at the home of the Royal Society of Medicine, gave a retrospect of some 40 years of surgery in Great Britain,[1] and almost simultaneously Prof. W. W. Keen, in an address given on receiving the Henry Jacob Bigelow Gold Medal of the Boston Surgical Society, reviewed his 60 years of surgery in the United States.[2] It is interesting to note the differences or coincidences of the addresses. Clinical surgery as practised in the United States in the pre-Listerian days was very comparable to what was experienced with us. Nothing was known of germs and germicides, assistants in the dissecting-room came directly to the surgical clinics, whilst soap and water were the only cleansing agents employed. The same revolving table was used for the cadaver in the lectures on anatomy and for the surgical operations in the clinics. The surgeons, one and all, operated in discarded blood-stained coats, and, as Mr. Berry pointed out, the operating costume of the surgeons here in the pre-antiseptic days was of a similar character. Every patient in the hospital was then given alcohol. The operative surgery of Keen's youth consisted of (1) amputations which now can be avoided for the most part; (2) ligation of arteries, especially for aneurysm and secondary hæmorrhage; (3) occasional excision of joints, not seldom fatal; (4) removal of external tumours, such as cancer of the breast; (5) ovariotomy. But the last was not done until the tumour was so large as to imperil life. Surgeons who removed ovarian tumours were under risk of persecution, and in 1846 Mutter, one of Keen's predecessors in the Chair of Surgery at the Jefferson Medical College, Philadelphia, said: "It is certainly hazarding but little to assert that in a very few years ovariotomy will be assigned to the oblivion it so well merits." In 1876 Prof. S. D. Gross could only refer to nine operations for goitre with three deaths. Lithotomy had long been done, but in 1878 Bigelow introduced litholapaxy. In 1867 Bobbs, of Indianapolis, first removed gall-stones from the gall-bladder. In his student days Keen frequently witnessed couching for cataract, and it may be pointed out that it is still a common practice in India. Operations on the chest and abdomen were almost invariably fatal, and appendicitis was never diagnosed as such in the United States until Fitz, of Boston, showed exactly where the condition originated. Surgical instruments were few in number and some of them were of a primitive nature: Keen had actually seen them stropped on the boot on two or three occasions, when they required sharpening. There were no artery forceps and primary hæmorrhage was profuse. The tying was done in so casual a manner, that it was largely a matter of luck if a clot formed. If not, when the ligatures came away, a secondary hæmorrhage ensued, which often necessitated the reopening of the wound to tie the artery again, or its ligation by a new incision higher up, or even a re-amputation. In 2235 cases of secondary hæmorrhage during the Civil War, 61·7 per cent. died. There were no modern retractors, while the hypodermic syringe and the aspirator were not in common use. Such are the changes within the life-time of a veteran surgeon.

[1] THE LANCET, Nov. 11th, 1922, p. 1015.
[2] Boston Medical and Surgical Journal, Oct. 26th, 1922.

PUBLIC OPINION AND THE CONTROL OF COMMUNICABLE DISEASE.

THE spirit in which the public health service of the United States of America is working to-day was well shown in the De Lamar lecture with the above title delivered on Nov. 6th by Dr. A. J. McLaughlin. The lecturer, who is a surgeon in the U.S. service, went so far as to say that "the tradition of the old health officer is a millstone round the neck of all who try to do public health work." This type developed when nuisances were supposed to cause disease. He lived and had his being in ordinances, and spent his working days in trying to think out new ordinances. He was an honest man, ready to play a lone hand—but he never aspired to be anything more than a policeman. Unfortunately, the type is even now not quite extinct. The reduction of the typhoid mortality rate was taken as an indication of what the old and new methods may accomplish. The reduction of this rate to about 21 per cent. of what it was in 1900 is evidence of the efficient control of water and milk supplies—a control which must by no means be relaxed. Further reduction depends essentially upon the coöperation of the individual citizen. If he will wash his hands thoroughly before handling food, and before eating, the evil effects of carriers will be eliminated. Police power alone, said Dr. McLaughlin, will be insufficient to control communicable disease—all health departments have more police power than they care to use. It is their immediate business to develop what is called in America a strong community spirit and a community interest in public health. British sanitarians call it carrying public opinion with them.

PHLEBOTOMUS FEVER.

THE rôle of the sand-fly as the transmitter of the virus of phlebotomus fever was first established by Doerr in 1908 and later confirmed by Surg.-Commander L. Kilroy, who, having exposed himself to insect infection, contracted the fever and then communicated it in the first 24 hours by injecting his blood into a healthy man. Doerr made the suggestion that infection was probably passed by hereditary transmission from the adult female sand-fly to the succeeding generation. This theory of transmission has not yet been established, and it may be that the larva acquires the virus by feeding on the infected fæces passed by the parent, or on the dead body of the parent. The fly's development through the ovum and subsequent stages to the fully-formed imago under known and practically sterile conditions has now been accomplished by Squadron-Leader H. E. Whittingham, R.A.F.M.S., who, at a laboratory meeting of the Royal Society of Tropical Medicine and Hygiene, held on Nov. 16th at the London School of Tropical Medicine, demonstrated a series of admirable drawings and microscopical preparations of the sand-fly. These illustrated the life-history of *Phlebotomus papatasii*, which covers a period of about six weeks, the exact time depending on conditions of temperature and humidity. The egg in its development shows certain changes of marking and on the ninth day caudal bristles appear. A few hours later the shell breaks on the dorsum by the action of the egg-tooth. The larva emerges and enters on its first "instar," lasting six days and ending with the first moult. In all the larva passes through four instars of about six days each, and four moults, during which occur not only increase in size but developmental changes characterising each period, such as the disappearance of the egg-tooth, the appearance of two and then four black caudal hairs, and of one and then two dark pigment bands on the terminal segments.

It has been found possible, as in the specimen shown of the living larva, to prolong the larval stage considerably by the retarding effect of increased moisture. With the conclusion of the fourth instar the larva enters on the pupal stage, lasting about nine days, before the emergence of the fully-formed imago. The wings of the newly hatched fly dry in three to four hours, and the mouth parts harden to allow of the sucking of blood within the first 24 hours. Copulation takes place in the next two days, and eggs to the number of 38 are laid six to ten days later. The length of life of the adult sand-fly is about two weeks, only one-third of the period of development from the laying of the egg to the hatching of the imago.

From these observations it seems that the recently bred imago is capable of infecting human beings, and that the phlebotomus is more than a direct vector. Apparently the virus does not attain pathogenicity or is not transmitted until the recently-hatched fly has lived some days and has already had and digested a feed of blood. Infected sand-flies which had been brought over to England from Malta had ovulated before death, and from the eggs a new brood of sand-flies were successfully hatched out in a modification of the special entomological chamber devised by Waterston for use in Macedonia. The adult imagines so obtained were found capable of infecting human beings. The nature of the infective agent is still unknown. The spirochæte demonstrated[1] in the blood of patients in Malta, alleged to be suffering from sand-fly fever by Dr. Whittingham last year, has not been found by subsequent observers in human blood or in the sand-fly. If the blood of an infected patient be withdrawn during the first 24 hours of fever and filtered through a Pasteur candle, injection of the filtrate is capable of setting up an attack in a previously healthy subject. This would point to the probability of an ultramicroscopic filter-passing virus, but more investigation is needed on this point.

AN ALIEN ASTHMA CURE.

INQUIRIES continue to reach us in regard to an alleged remedy for asthma and kindred ailments which is being widely advertised in the daily press. The treatment is stated to have been discovered by Dr. Martin Olpe, of Düsseldorf, in 1920; thousands of patients are said to have been cured thereby, the average of recorded cures being well over 90 per cent. At the London centre, which is under the charge of Dr. Hans Rohde, "a specialist in bronchial diseases," 60 to 70 patients of all ages and in every stage of suffering are said to be taking the treatment daily, and no case of asthma is considered there to be hopeless. We may again call attention to the fact that the treatment known as "Olpenapneu" appears to be without honour in its country of origin. The Prussian Ministry of Health thought it necessary to issue an official bulletin on the subject three months ago, in which it is stated that the discoverer, Martin Olpe, is not a doctor of medicine but is reputed to have obtained a degree of Dr. Litt. in America. The bulletin indicates that by means of advertisement the licence to carry out the cure and to set up dispensaries is being offered for large sums of money, ending with the warning that the danger exists that uninformed persons may be harmed. We have ourselves failed to find the name of Hans Rohde on the British Medical Register or in any book of reference containing the names of German specialists. Nevertheless, we cordially agree with the statement that there is no case of asthma that should be considered hopeless. No doubt every physician is confronted with cases which have run through the gamut of remedies before coming to him. But in one way or another most of them secure longer or shorter intervals of relief if not an entirely satisfactory modus vivendi. Recent work on protein desensitisation has opened a promising field for research on those cases which do not respond to older forms of treatment, but until the practical details of this method are more fully worked out, it is likely that some sufferers from asthma will continue to endeavour to shortcut their ills by the use of any advertised remedy. The relief of asthma is often dependent on the active coöperation of the patient in adjusting the habits of a life-time: it is a condition in which the will to get well is a large factor, and the will is unfortunately absent in many of those who suffer from it. These poor people run about after anything offered as palliative; they need to learn to face their malady and require both instruction and encouragement. The time may have come to set up in connexion with one of our established chest hospitals an asthma clinic at which all available therapeutic weapons might be systematically applied, and where especially protein desensitisation and psychotherapy receive intensive study. The difficulties would be considerable, but some alternative is needed to the asthma cure of commerce which in the long run blesses him that gives more than him that takes.

[1] THE LANCET, 1921, ii., 1164; Proc. Roy. Soc. Med., March, 1922, vol. xvi., pp. 1–14.

THE ANÆSTHETIST'S RESPONSIBILITY.

IT is one of the attractions of medicine to those who give their lives to one of its many branches that it is always changing and developing; new branches arise which need to find their place in the whole discipline. There is no creed or statute law to stultify progress, and the internal relations of medicine are amenable only to what is sometimes, but very inadequately, known as medical etiquette—more correctly, equity or the golden rule. Mr. J. D. Mortimer, in a lecture which we print at the front of the present issue, discoursed in very practical fashion to the Fellowship of Medicine on the medico-legal position of the anæsthetist, touching lightly on the relation between anæsthetist and surgeon. A valued correspondent recently raised the question of the choice of anæsthetic, and we gladly give it consideration, for it is interesting from several points of view. In the particular case brought forward an ophthalmic surgeon had for several years worked successfully with an anæsthetist who at first used always chloroform, later a mixture of chloroform two parts to ether one part. The new anæsthetist prefers a mixture of ether 32 parts to chloroform one part—almost, in fact, pure ether. His results are not so good as those of the former administrator. Generally speaking, of course, when the anæsthetic is given by an expert the surgeon leaves the choice to him. Seeing that the anæsthetist will certainly be held responsible for the results of the administration, this is the only fair course. Moreover, in any difficult or unusual case the two would probably discuss together before operation what anæsthetic would best suit both of them as well as the patient. Regarding ophthalmic operations in particular, the general preference for ether must be entertained with reservations. The operation of enucleation of the eye, for instance, is generally best treated on the usual lines and ether preferred. The same may be said for many operations for squint. On the other hand, iridectomy, if a general anæsthetic is needed, and cataract extraction under the same circumstances are certainly better suited by chloroform, or a mixture mainly composed thereof. Whatever anæsthetic is used these cases demand a deep degree of narcosis. Here seems to lie the real cause of trouble in the instance by which we are led to these observations. The administration of the mixture mainly composed of ether apparently does not habitually obtain a level of anæsthesia deep enough to ensure absolute stillness. This is naturally objectionable to the surgeon. He refers the trouble to the anæsthetic chosen. Probably, however, it is not the anæsthetic but the anæsthetist who is responsible for the imperfect condition. It seems clear that responsibility for the choice of anæsthetic must rest with the administrator, supposing, of course, that he is a qualified man and not in the position of hospital junior acting under instruction. For consider what would happen if anything untoward occurred and

was attributed to the anæsthetic. The anæsthetist would not be forgiven on the plea that he did not choose the anæsthetic. By administering it he took the responsibility for it. Therefore, he must be given free choice. In practice there is rarely disagreement between the desire of the surgeon and the choice of the expert anæsthetist.

THE MECHANICAL TREATMENT OF SEVERE DROPSY.

THE relief of severe cardiac dropsy in cases in which the ordinary treatment by salt-free diet, diuretics, and cardiac tonics fails, is often a difficult and disappointing clinical problem. The mechanical treatment by drainage from the legs through Southey's tubes or by incisions is generally recognised as a valuable method, but it is frequently only partially successful and is attended by the risk of inflammatory changes round the punctures or incisions, which are often slow to heal. Moreover, there is the further risk of septic infection, with disastrous possibilities, unless the strictest care is exercised, such risks being greatly increased in renal disease. These points are clearly pointed out in an admirable note on the subject in this issue of THE LANCET, by Dr. J. Walter Carr. In it he puts forward a valuable practical suggestion for obviating some of these risks by a simple technical procedure, which consists in making punctures with a large straight surgical needle into the skin of the dorsum of the foot or over the malleoli. The patient sits in a cardiac chair till the legs swell, the skin is cleaned with soap and water, then rubbed with ether, and painted over with a 2 per cent. solution of iodine. Five or six punctures are made close together and then sterile gauze and wool are applied. The feet may rest on wooden blocks in a large basin, into which the fluid drains. Dr. Carr gives details of an instructive case in which he applied this method with excellent results after other methods of treatment had failed. The patient remained in the chair for about five weeks, during which time over 26 pints of fluid were drained away. It is interesting to note that when he was waterlogged, before the drainage was started, he was very intolerant of digitalis, whereas later he was able to take digitalis and strophanthus for weeks on end. The punctures did not give rise to any trouble, and they were repeated as soon as they closed or failed to drain freely. Dr. Carr, in some remarks upon the case, lays stress upon the importance of securing adequate sleep in cases of cardiac failure, and recommends the use of morphine, preferably with atropine, for this purpose. We commend this valuable note to our readers, as much clinical wisdom is compressed in short compass in it.

THE DANGERS OF FILIX MAS.

FATAL cases of poisoning by filix mas are rare in this country. In 1914 Dr. F. Schotten[1] published a fatality resulting from the administration of filix mas to a woman suffering from Addison's disease. The exact dosage in this case was not ascertained, but the case was instructive as showing that filix mas may prove fatal even when prescribing it simultaneously with castor oil is avoided. Several cases have been recorded of alarming symptoms, culminating even in death, after the administration of castor oil with the extract of filix mas, and there seem to be good grounds for believing that castor oil favours the absorption of the most toxic constituents of the extract. One recorded case is specially instructive in this respect. A child took 240 gr. (16 g.) of the extract alone without ill effect; three weeks later half this quantity taken with the same amount of castor oil was rapidly fatal. A more recent paper by Dr. Olav Hanssen[2] is instructive as showing that even in the absence of castor oil, and in doses hitherto regarded as moderate, the extract of filix mas almost invariably provokes bilirubinæmia. It is not uncommon when, as is the case in Germany and Italy, the extract is given in as large doses as 20 g., for jaundice to be provoked. But though Dr. Hanssen gave only 10 g., the bile content of the blood was almost invariably increased, and in some cases there was slight pigmentation of the skin. During the past six years he has given the extract of filix mas to 20 of his hospital patients on the morning following a day of dietetic restrictions. The combined administration of 10 g. of the extract with 2 g. of kamala in barley broth was followed in an hour by a dose of jalap and calomel. Only in one case, that of a boy, aged 11, who was given only 5 g. of the extract, was there no bilirubinæmia. In the remaining cases the discoloration of the serum was demonstrable within two to three hours of the administration of the drug; it culminated in one or two days, after which it gradually disappeared. Urobilin was not invariably demonstrable in the urine, which never contained bile pigments or albumin. Grawitz has assumed that the colour changes induced by the extract of male fern are the result of injury to the liver and increased blood destruction. Dr. Hanssen has never succeeded in demonstrating blood destruction in his cases in which the percentage of hæmoglobin and the number of the red cells were increased rather than diminished—a result traceable to diarrhœa and the resulting concentration of the blood. Further observations have led him to the conclusion that the extract of male fern interferes with only one of the many functions of the liver—i.e., the secretion of bile, and that there is no reason for regarding the jaundice of male fern treatment as hæmolytic. Although no permanent ill-effects were observed in his 19 cases, bilirubinæmia possesses a sinister significance when it is regarded as an early sign and stage of acute yellow atrophy of the liver, and as there is also the risk of chronic cirrhosis of the liver developing on the basis of male fern bilirubinæmia. The diazo-reaction might throw some light on the actual pathological changes. Dr. Hanssen is obviously justified in urging caution in the exhibition of this drug, and in demanding that it should not be purchasable without a doctor's prescription.

[1] Münch. med. Woch., Nov. 3rd, 1914.
[2] Medicinsk Revue, July-August, 1922.

THE Thomas Vicary Lecture of the Royal College of Surgeons of England will be delivered in the Theatre of the College by Mr. Walter G. Spencer on Thursday, Dec. 14th, at 5 P.M. The subject of the lecture will be Vesalius and his Delineation of the Framework of the Human Body.

IN view of the coming into force on Nov. 30th of the Dentists Act, 1921, which prohibits the practice of dentistry by persons who are not registered dentists, the special authority given to certain unregistered dentists under the Dangerous Drugs Act, 1920, to purchase local dental anæsthetics containing cocaine has been withdrawn from the same date.

Sir Clifford Allbutt has accepted the position of President of the West London Hospital Post-Graduate College. Prof. Clifford Allbutt's interest in post-graduate education is well known, and his recent lectures at the College on Kinds of Pneumonia and Angina Pectoris attracted large and appreciative audiences; they indicated how largely the future of medicine in Great Britain depends upon the development of general practice.

ASSOCIATION OF ECONOMIC BIOLOGISTS.—A general meeting of the Association will be held at Manchester on Dec. 15th and 16th. On the 15th, in the Botanical Department of the University, Dr. W. Lawrence Balls will open a discussion on Genetics in Relation to Applied Biology. At 8.15 P.M. informal discussions will be held on the Place of Applied Biology in Universities and on the Relation of Biology to Medicine. On the 16th a visit will be paid to the British Cotton Industry Research Association, Shirley Institute, Didsbury, Manchester.

THE WORK OF THE M.A.B.[1]

PULMONARY TUBERCLE IN ADULT MALES.

KING GEORGE V. SANATORIUM, GODALMING, SURREY.

THIS, the latest of the Metropolitan Asylums Board sanatoriums, has been erected on an ideal site in Surrey, three and a half miles from Godalming and one and a half miles from Milford, on level ground half-way up a hill 600 feet high. The buildings, on sandy soil, are sheltered on the north and east, and command a magnificent view to south and west, the grounds covering an area of 57 acres (62 acres including the sewage field). The sanatorium, which is intended for adult male patients and contains accommodation for 232 cases, was opened on June 8th, 1922, with 100 selected case from the Downs Sanatorium at Sutton; since that date the numbers have steadily gone up, until at present all the available beds are occupied, one eight-bed ward being temporarily utilised as a recreation room pending the completion of building operations.

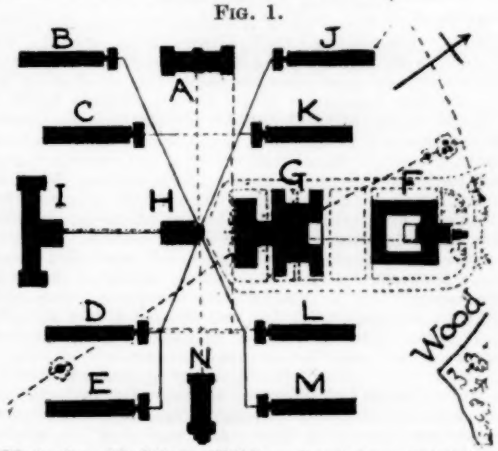
Administration Block.

The general plan of the institution is shown in Fig. 1. The administration block is in a central position and contains the medical superintendent's office, the dispensary and X ray room, an examination room, opening out of which is a patients' changing room, a waiting room, and offices for matron and steward. From a large waiting hall at the north end of the block four covered ways radiate, each giving access to two convalescent pavilions. From the south end of the administration block another covered way leads to the hospital block, a two-storied building reserved for acute or semi-acute cases. Both floors are built on the same plan, with a central day-room, on each side of which are two single-bed and two double-bed wards facing south-west, and a four-bed ward at right angles to these at each end of the block. All the wards open out on to a verandah wide enough to admit of beds being wheeled out, although not of sufficient width to give protection in stormy weather—a point which matters the less that no patients sleep out at night in the open air except in very settled weather.

Convalescent Blocks.

The convalescent blocks, of which there are eight, are built on a somewhat different plan, and on one floor only (Fig. 2). Here there is a central corridor from which four single-bedded and six double-bedded rooms open out, with an eight-bedded ward leading into an open day-room at one end of the block, and dressing rooms, locker room with hot pipes for drying damp clothes, bath-rooms, duty room, and lavatories at the opposite end. Each pavilion is mounted on a concrete raft, the walls being also of reinforced concrete. The floors throughout are of decolite. A conspicuous feature of all the wards is the large area of window space, and the arrangements made for securing through ventilation. In the pavilions, for example, more than half of the front of each ward is made to open, the windows being of the stable-door type; while fanlights on the opposite side of the room open into the central corridor and are seldom or never closed—most of them, indeed, having no glass.

FIG. 1.

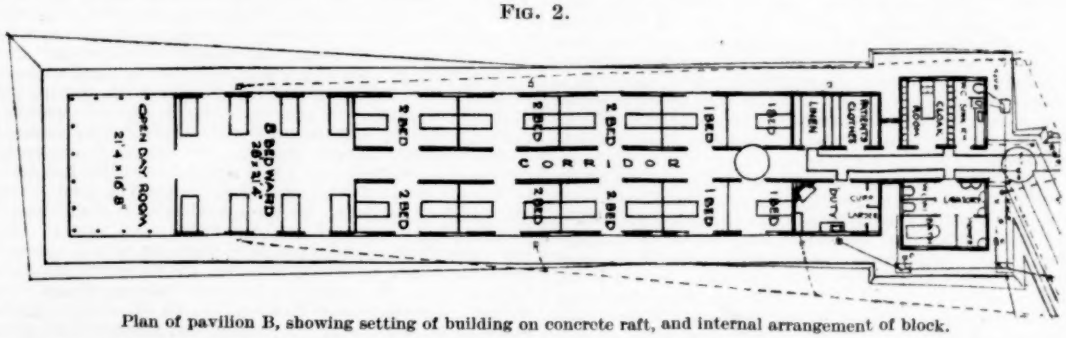


Block-plan of buildings, Highdown Sanatorium, Godalming, Surrey.
A = Nurses' Home. B C D E J K L M = Pavilions. F = Power Station. G = Dining Hall, &c. H = Administration. I = Hospital Block. N = Chapel and Recreation Hall.

Dining and Kitchen Accommodation.

There is a large dining-hall, with seating accommodation for 200, for the use of all the patients except those in the hospital block, but the hall can be enlarged still further if necessary by taking in two smaller rooms adjoining, which are divided off by a movable partition and are otherwise used as billiard rooms. The crockery used by the patients is sterilised by steam, seven maids being detailed for washing up and for general service in the dining-hall and pavilions. The kitchen block, which is equipped with the latest labour-saving appliances, contains excellent store-rooms, not only for food, but also for clothes, a large stock of which is kept for the purpose of lending to patients who may possess an inadequate outfit of their own. Clogs are also lent to the patients engaged in outdoor work. The social welfare of the patients has not been overlooked. There is a large recreation-hall which is being equipped with a cinematograph apparatus, and almost every week there are held concerts and entertainments for the men. The same hall also does duty as a chapel, the chancel being screened off when the building is used for secular purposes. An important part of the scheme at the sanatorium is the provision of workshops for the men in which they are to be taught various trades. Two such workshops at present in full swing are for carpentry and leather work respectively, each being in the charge of a whole-time qualified instructor. The complete course takes about

FIG. 2.



Plan of pavilion B, showing setting of building on concrete raft, and internal arrangement of block.

[1] An article dealing with Surgical Tuberculosis in Children appeared in THE LANCET of Sept. 23rd, p. 683.

12 months, at the end of which time the men are able to earn a reasonably good living by their new employment. Dr. James Watt, the medical superintendent, hopes in the near future to add mat-weaving and china repairing to the handicrafts taught here.

Laboratory Accommodation, &c.

At the northern end of the sanatorium is the power station, containing the accumulator room, the engineer's shop, the engine house, and the boiler house. The mortuary, post-mortem room, and laboratory are also in this building. None of the routine work of sputum examination is carried out in the sanatorium, the specimens being sent to the Belmont laboratories, where practically the whole of the bacteriological and pathological work of the Metropolitan Asylums Board is carried on save for the routine examination of swabs and cultures for the diphtheria bacillus. The small laboratory at the King George V. Sanatorium is, however, well equipped, and Dr. Watt looks forward to the time when research work in tuberculosis can be undertaken here, a development hitherto precluded by the smallness of the medical staff, which consists only of the medical superintendent and two assistant medical officers.

Disinfection and disposal of the sputum is carried out in a simple but effective manner, the orderlies on this duty wearing rubber gloves and aprons. Trays of sputum cups and flasks are collected on special trolleys; the sputum is then emptied into a small jacketted tank and boiled by steam, after which the trays containing the empty vessels are plunged into another tank and boiled in live steam. Disinfection is effected in this way with a minimum of handling.

Classification of Cases and Treatment.

The classification of cases adopted in the King George V. Sanatorium is that devised by the Society of Sanatorium Superintendents, consisting essentially of a combination of the three Turban-Gerhardt groups with various grades of constitutional disturbance, A, B, and C, giving in all nine groups of sputum-positive cases. Of these groups only those cases which are presumably recoverable are eligible for admission, which in practice usually excludes cases in groups II. C. III. B and III. C. Turban-Gerhardt group III. are not eligible unless the constitutional disturbance is slight. All the London County Council cases of true sanatorium type which used to be sent to Frimley are now being sent to King George V. Sanatorium, but these not being sufficiently numerous to fill the beds, other less favourable cases are taken in as accommodation permits. The sanatorium has, of course, not been running long enough to allow of results of treatment to be tabulated, but while occasionally patients with little anatomical disease prove disappointing owing to their small powers of resistance, the cases as a general rule do very well, and the end results should show a marked improvement on those of the Downs Sanatorium where moderately advanced cases used to be taken.

Although the length of stay varies from two to six months, with an average of three months, there is no limit to the time a patient may be kept provided the case is suitable and is responding well. The great majority of the patients have spent a month or so at Brompton or at Victoria Park Hospital before being drafted here, while all those who on their discharge from the sanatorium are fit for work are kept under "general dispensary supervision," reporting at the appropriate tuberculosis dispensary at intervals of one to six or even 12 months. Other cases, such as those in whom an artificial pneumothorax has been induced, usually attend as out-patients at Brompton or Victoria Park, some being sent for domiciliary treatment by their own panel doctor.

Artificial pneumothorax is practised only on those who are not doing well after two to three months of ordinary sanatorium treatment—i.e., it is reserved for otherwise hopeless cases, provided the disease is unilateral. An average of three or four cases are usually under this treatment at any given time, the intervals between each induction being gradually lengthened to four weeks. The X ray department, which is well equipped and has a specially adequate system of ventilation devised by the architects, is particularly useful in the pneumothorax cases.

The graduated work or exercise which is a most important part of the sanatorium treatment is in this particular institution based on the Frimley system. No useless work, such as carrying weights is prescribed. The six grades of outdoor work are of the following types:—Grade I.: Sweeping, picking up papers, weeding, &c.; Grade II.: hoeing; Grade III.: digging soft soil with a small spade; Grade IV.: digging hard ground with a medium spade; Grade V.: navvy work—digging, trenching; Grade VI.: similar work to that of Grade V., with longer hours. The work is usually done for four hours a day, including a little housework, and the importance of measuring it exactly like a dose of medicine is impressed upon the patients. The men on the various grades wear badges of a distinctive colour, and are given exercise cards on which the prescribed work is noted with the date and initialled by the medical officer. Rest hours must be taken recumbent on the bed or in a deck chair, reading being allowed, but not talking or writing. The daily time-table is as follows:—

7 A.M., temperatures taken; 8, breakfast; 9.30, sick parade or grading; 10, begin prescribed exercise or work; 11.45, cease work; 12 to 1 P.M., rest hour; 1, dinner; 2.15, begin exercise or work; 4, cease work; 4.30, tea; 6 to 6.50, rest hour, temperatures taken; 7, supper; 8.30, evening bell; 9, lights out, silence.

An average of more than half the patients are usually on the different grades of work, the remainder being in bed, or on rest or walking exercise. Admission to the sanatorium is obtained through the London County Council.

MEDICINE AND THE LAW.

The Medical Witness in the Criminal Court.

MANY recent and sensational events have proved that the medical man may be called upon at any time to act as a witness in a criminal case, and should be therefore able to give his evidence in a clear and accurate manner. The whole case may hinge upon his ability to tell the scientific truth in such a way that the facts may come out with their relative importance. On two occasions recently Dr. B. H. Spilsbury has spoken publicly and out of unrivalled experience on the subject at a meeting of the Cambridge University Medical Society on Nov. 1st,[1] and later to the staff and students of the Middlesex Hospital. In the second address Dr. Spilsbury laid stress on the special value of a good working knowledge of chemistry and of physiology. On these subjects the medical witness must be absolutely clear; familiarity with pathology and bacteriology was also likely to be directly useful.

Dr. Spilsbury's criticism that the training in medical jurisprudence in our medical schools is inadequate cannot be contradicted; it is a fact that little advance had been made in this direction during the past 30 or 40 years; in fact, he found Caspar's well-known text-book of medical jurisprudence still one of the best text-books, and that is a German work, though the Sydenham Society published an excellent English translation. In contrast to our backwardness the subject is well taught in French and other European medical schools, and Dr. Spilsbury, referring to this position, was of the opinion our lethargy is responsible. The English practitioner, he thought, lacked interest in the subject, and generally shirked, if possible, giving evidence in a criminal case, and would use his utmost endeavours to keep out of a case which threatened such an issue.

Experimental Search for Evidence.

In commenting upon a paper by Dr. R. E. House, of Texas, upon the Use of Scopolamine in Criminology, THE LANCET[2] suggested that any practical use of scopolamine, such as Dr. House appears to

[1] THE LANCET, Nov. 11th, p. 1017.
[2] THE LANCET, Nov. 18th, p. 1082.

think possible, in the course of the investigation of crimes would be out of the question in this country. There is a suggestion already that our police, in questioning persons detained as suspects, but not yet formally charged with any crime, go very far in the direction of leading them to incriminate themselves. It is asserted that they resort unfairly to the method of inducing prisoners temporarily placed together to repeat each other's conversations. Such methods are repugnant to our national sense of justice. We do not certainly permit anything approaching the "third degree" practices which obtain in the United States, or the methods of the French *juge d'instruction*. The infallible usefulness of any drug in obtaining the truth from an unwilling deponent would have to be established first beyond any question before any civilised judicial administration could countenance its use. But, even so, there would still be considerable difficulties to be overcome before British courts would accept as evidence any information obtained by such means.

Dr. House suggests the examination of a prisoner under scopolamine as a method of obtaining clues to be afterwards confirmed and amplified by inquiry, rather than the eliciting of confessions to be produced in court, and he is, no doubt, fully aware of the limited applications possible for experiments such as he has made. He does, however, suggest that prisoners might be made to admit their guilt or to deny it in circumstances which would place their statements beyond any suspicion of untruth. There seems here to be one obvious comment that any lawyer would make, if he were to be assured that fuller experiments had confirmed Dr. House's observations and that scopolamine had a "legal future." He would point out that Dr. House had only suggested the application of scopolamine tests to persons accused or convicted of crimes, and he would ask why in reason and justice should its use be confined to them and to private inquisitions in police cells. Why should not the policeman at a police court who gives evidence, the truth of which the accused denies, submit to examination under scopolamine? Why should not all the witnesses for the prosecution or defence receive the same test as the accused? Why should the prisoner, who can always be called as a witness, be the only person "scopolamined," while others are only "cross-examined?" Further, why should the scientific ascertainment of the whole truth and nothing but the truth be limited to criminal cases. Perjury is not unknown in civil courts. The divorce court affords prominent and numerous examples of cases in which perjury regularly takes place on one side or the other, but is not brought home.

A Medical Man's "Running-down" Case.

At a county court recently an action was brought by an elderly woman against a medical man who had knocked her down when driving a motor car. At the opening of the case the question was raised whether it should be tried with a jury, Judge Herbert Smith questioning the right to have one. After discussion, the solicitors representing the parties agreed to leave the decision to the judge, who accordingly tried the case alone. Evidence was given which appears to have been of the usual kind, involving questions as to whether the plaintiff should have seen the defendant, and as to whether there was negligence on his part. His Honour in giving his decision, reviewed the evidence at length and said that he was glad that the case had been left to him to determine, as he felt there might otherwise have been a miscarriage of justice. Basing his decision on the evidence only, he found that the defendant did use his hooter. He thought that it would be an injustice if he decided that the medical man was to blame for the accident, which, he found, was brought about by the plaintiff herself, who was deaf, not taking reasonable precautions. He accordingly gave judgment for the defendant with costs. The county court judge's references to the sympathy which frequently obtains from a jury for a plaintiff damages to which he is not justly entitled on the evidence are interesting. Whatever the advantages of a jury may be in the administration of justice, their sympathies undoubtedly lead them at times into giving verdicts for a person injured against a defendant apparently able to pay damages, when the essential condition of negligence has not been proved. The medical man is to be congratulated on having successfully defended the action. To have been found negligent by a jury is a serious matter, and to defend such an action is necessary if a man is to avoid having it brought up against him, should he at some future time have another accident.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Celebration of Pasteur's Centenary.

SUBSCRIPTIONS are coming in from all over the world for the adequate celebration of the Pasteur Centenary at Strasbourg next year. A monument is being erected by public subscription on the "Place de l'Université." An exhibition illustrating Pasteur's work will be shown in a permanent museum, exhibiting the various stages of his scientific life. Adjoining the museum will be rooms in which will be exhibited apparatus and documents from the Paris Pasteur Institute and from other Pasteur Institutes, as well as from laboratories from all parts of the world. The idea of this exhibit is to make plain the development and spread of bacteriological studies which have originated from Pasteur's works, and an important industrial and agricultural show is also being organised, to demonstrate the revolution which took place not only in medicine, surgery, and hygiene, but also in industry and agriculture following his discoveries. Commemoration prizes will be awarded to exhibitors whose products are founded on the most scientific basis. Eventually the site of the exhibition, which will be held on the outskirts of Strasbourg, will be made into an experimental ground where farmers will be able to witness the most recent progress of agricultural technique. A series of congresses will be held at Strasbourg during the Pasteur Exhibition, including conferences on tuberculosis, cancer, syphilis, puericulture, birth-rate, and hydrology.

The Académie de Médecine and Driving Licences.

At a recent meeting of the Académie de Médecine, Mr. C. Fiessinger proposed the following medical considerations which, in his opinion, ought to be introduced in a Bill concerning the grant of driving licences with a view of reducing the number of accidents: 1. Driving licences should not be given to anybody under 21 years of age. 2. Those who suffer from any deficiency of hearing or sight should have to undergo an annual medical examination by a specialist whose duty it would be to ascertain whether there is not any change in their condition marked enough to interfere with their ability to drive a motor-car. 3. Anyone holding a driving licence should have to be periodically examined before a special medical board, the average interval between these medical examinations being three years; on the occasion of such examinations, auscultation of the heart, estimation of blood pressure, and tests of the state of the nervous system should be performed; if a new licence is granted it should be only for a limited period of stipulated duration.

International Congress on Social Hygiene.

The International Congress for the Propagation of Social Hygiene will be held in Paris during May, 1923. The Congress will be presided over by Mr. E. Roux, director of the Pasteur Institute; Mr. A. Calmette and Mr. J. L. Breton have been appointed vice-presidents.

The death of Prof. Louis Rénon, elected professor at the Faculté de Médecine of Paris in 1920 and a member of the Académie de Médecine, is announced.

Nov. 24th.

Correspondence.

"Audi alteram partem."

THE DRAWBACKS OF CÆCOSTOMY WITHOUT GENERAL EXPLORATION.

To the Editor of THE LANCET.

SIR,—In an article on the treatment of acute obstruction due to carcinoma of the colon, in THE LANCET of Nov. 25th, Mr. J. P. Lockhart-Mummery recommends the surgeon to make a cæcostomy without general exploration of the abdomen, a method which was also advocated by Sir Berkeley Moynihan about 18 months ago at a meeting of the Medical Society of London. These two surgeons are such great authorities, that any attitude short of complete agreement with them must require considerable justification before it can be adopted. Yet I think a little reflection would convince most surgeons that to make this procedure a routine would land us often in rather an unfortunate predicament. I do not say that the method should never be employed, but rather that it should be reserved for desperate cases.

Mr. Lockhart-Mummery in advocating this blind cæcostomy has mentioned some of its advantages but gives scant consideration to its drawbacks, which are indeed very real. Putting aside the question of the possibility of a wrong pre-operative diagnosis, there is the difficulty of planning the subsequent steps to be taken. If we do not know where the growth is situated, owing to the absence of a primary exploration, we must either perform an exploratory laparotomy or give a barium enema for X ray examination. Suppose, as he suggests, we open the abdomen on the left side, how are we going to remove a growth in the hepatic flexure without unnecessary mutilation? I have done this through a mid-line incision, but one is unnecessarily hampered by difficulty of access to the ascending colon, and I feel it would be much more difficult from the left side of the abdomen. It might be thought that skiagraphy would remove the objections to the blind cæcostomy. But this is not so. I once relied upon a barium enema to show me the site of obstruction after performing a simple cæcostomy. The plate showed a definite stricture at the splenic flexure, I planned the incision to remove a growth here, only to find that it was in the pelvic colon. Twice have I seen this spasm at the splenic flexure associated with a pelvic growth, and only this very morning I operated upon a man who got acutely obstructed whilst actually in hospital owing to a ring growth in the pelvic colon. A barium enema a few days before had run freely into the colon; no stricture was visible. The truth is that a stricture can be concealed in the pelvic colon if one loop lies in front of another in the skiagram.

To deal with Mr. Lockhart-Mummery's objections to a primary exploration—the expulsion of dilated coils, the rupture of the cæcum, the increase of shock. The best way to deal with the cæcum is to have a moderately large hollow needle ready, so that as soon as the abdomen is opened and this viscus presents it can be punctured. Nearly always through this needle sufficient gas will escape to remove all danger of spontaneous rupture. The cæcum will then be amenable to manipulation and the small puncture can be sutured. It is truly remarkable how patients extremely ill, in whom the cæcum actually begins to rupture on the table, will recover with simple cæcostomy and will require further treatment. As to the question of the increase of shock. This is bound up with the permission afforded the distended coils to protrude. It is a general rule in abdominal surgery that the best place for a viscus is inside the peritoneal cavity. There is very seldom need to allow distended intestines to come on to the surface, except one coil at a time. The deliberate gentle insertion of the hand to determine the site of the growth can be done with very little insult to the viscera and the knowledge gained is almost inestimable in value. Suture of the abdominal wall will present but few difficulties if the forceps described by me a few years ago in "Surgery, Gynæcology and Obstetrics" (1920, xxx., 408) be used.

I am, Sir, yours faithfully,

CHARLES A. PANNETT,
Professor of Surgery, St. Mary's Hospital Medical School.

St. John's Wood, Nov. 24th, 1922.

THE RETURN OF VIRULENT PNEUMONIA.

To the Editor of THE LANCET.

SIR,—I consider that I should write to you on the above subject, for the fatal pneumonia, so difficult to diagnose, met with a few years ago, is with us again.

A youth of 21 years was quite well on the morning of Thursday, Oct. 19th; towards the end of the evening of the same day he felt unwell and retired to bed early. During the night he had four attacks of diarrhœa, and after the last one, when returning to his bedroom, fainted. I was asked to see him on Friday morning early (Oct. 20th) and found his temperature raised and his pulse quickened; he had been delirious; the pulse-respiration ratio was not suggestive. The only chest sign he presented was an almost complete absence of the breath sounds over both lungs; there was no dullness to percussion, no adventitious sounds, and tubularity in the small fraction of breath sounds which was heard, but only occasionally, towards the upper part of the lungs. While I was writing a prescription and discussing the illness with the parents in a room downstairs he got up, dressed and sat by the fire. His parents persuaded him to return to bed, but when the nurse arrived shortly after he had become so ill that she telephoned to me to come and see him again. I went at once and found that he was obviously dying. Death took place at 12.45 P.M. There had been no cough and the signs were as above described at my first visit.

A younger brother, aged 18 years, attended the elder brother's funeral on Tuesday, Oct. 24th. This younger brother had had a sore throat on Oct. 22nd, 23rd, and 24th. On the evening of the 24th the soreness of the throat had abated, but his voice had become hoarse. I was called to see him on Wednesday, Oct. 25th, when I found him dressed and sitting by the fire. His temperature was normal, and his pulse-rate 72. I could find no physical signs other than congestion of the fauces. On Thursday morning, the 26th, I was summoned by telephone and found he had become worse; his temperature was 103·5° F., his respirations 42, and his pulse 140, and he had a somewhat "brassy" cough such as is met with in cases of laryngitis. The physical signs of the lungs were like those of his brother—viz., *universal and almost complete obliteration of the breath sounds.* The percussion note was resonant everywhere, and there were again absence of tubularity in the vestige of breath sounds which could be brought out in forced breathing; there were no adventitious sounds; both knee-jerks were absent. The patient was quite conscious, answered questions intelligently and said that his only complaints were loss of voice and discomfort beneath the breast-bone.

With the fate of his elder brother in my mind, I asked for a consultation. This took place at 6.30 P.M. on Thursday, Oct. 26th, but no further signs were elicited. It was obvious that the patient was suffering from a severe infection of the larynx, trachea, bronchi, and bronchioles, possibly by the organism of diphtheria, or by some streptococcus, which by blocking the bronchial tubes, led to the weakness of the breath-sounds, reminding me of the co-called epidemic influenzal pneumonia of a few years ago, which so often occurred, as shown by post-mortem examination, without revealing signs of consolidation. Anti-streptococcal and anti-diphtheritic sera were injected. I visited him in the morning of Friday, Oct. 27th, finding no improvement in symptoms and no alteration of the physical signs. I was summoned again in the afternoon at 5 o'clock, as the patient had suddenly become very collapsed. I found his face cyanosed and in a few moments he died.

A post-mortem examination was made at 11 A.M. on Oct. 28th. Practically the whole of the left lung presented soft consolidation, revealing the appearance and consistence of liver undergoing autolysis, the surface of the lung was purple-red in colour and the cut surface readily broke down on pressure; the right lung was affected in the same way, with the exception of the middle lobe, which in its anterior part was markedly emphysematous. No diphtheria

organisms could be demonstrated anywhere; the *Streptococcus hæmolyticus* was found in the heart blood.

Both of these brothers about a fortnight previously to the death of the second one had visited an exhibition of the application of electricity to domestic purposes, and they had found the atmosphere very hot and oppressive and the hall crowded with people. I think it is very probable that the elder brother died of the same sort of infection as the younger one, and that he also reacted to the infection in the same way, by developing pneumonia which, as in the case of the younger brother, gave minimal signs.

I am, Sir, yours faithfully,

London, Nov. 22nd, 1922. C. G. MACK.

PERMANGANATE OF POTASH IN SMALL-POX.

To the Editor of THE LANCET.

SIR,—In view of the fact that small-pox is spreading, and that some of the cases are of a virulent type, it seems advisable to re-direct attention to the method of treatment introduced by Dreyer of Cairo in 1910, but which apparently has been forgotten save by the Germans, who have used it on several occasions with marked success. Accordingly, I append part of a short paper on the subject which I contributed to the *Journal of Tropical Medicine and Hygiene*, and which was published on Feb. 15th, 1921.

Anyone familiar with variola amongst natives in the tropics, and more especially in the outlying districts, must have been impressed by the urgent necessity of some means of treatment likely to mitigate the sufferings of confluent cases and to prevent complications.

Small-pox in the unvaccinated and amongst primitive surroundings is a very terrible disease. I have seen outbreaks in Persia, East Africa, Uganda, Egypt and the Anglo-Egyptian Sudan, sometimes in places where proper hospital facilities were lacking, and where the condition of many of the patients was pitiful to behold. The doctor, with no ally in the shape of a trained nurse, is often at his wits' end to know what to do in such cases, and a simple method like that of Dreyer should be hailed as a boon and a blessing, especially as its value appears to have been definitely established. Indeed, Bender, of Breslau, states that he regards it as superior to every other therapeutic measure in small-pox. His technique is as follows:—

When the patient is admitted to hospital his whole body is painted over with a freshly-prepared saturated solution (5 per cent.) of potassium permanganate. On each successive day the same solution is applied, unless the skin is found too sensitive, in which case a weaker solution is employed, one of 1·5 per cent. being often suitable.

Favourable results from the use of permanganate solution have also been recorded by Kulka, Jochmann and Morawetz. Indeed, the only discordant note is sounded by Rolly, who, according to Kulka, was sceptical as to the utility of the treatment. I have not been able to consult Rolly's paper, but the other authors all undoubtedly think well of the method, though they differ somewhat in the strength of the solution they employ. Kulka, for example, finds 3 per 1000 efficient, but as he speaks of this as a concentrated solution it is possible that he really means 3 per cent.

Dreyer[1] had two objects in view when introducing the treatment, the first being to colour the skin and thereby obtain an effect similar to that which the Finsen red light treatment is said to produce; the second to secure a disinfecting and deodorising action.

In the view of many the value of the red light treatment of small-pox is not considered to have been established, and hence the good results of the Dreyer method must probably be attributed solely to the germicidal and oxidising powers of the permanganate.

There seems to be no doubt that in the case of small-pox this line of treatment, especially if employed early, is of signal service in lessening the suppurative process and adding to the patient's comfort. It is also said to prevent complications, the formation of bed-sores, and the occurrence of general sepsis. Septic fever is thus avoided and the recovery rate improved. As the suppuration is mitigated the pitting of the skin is reduced.

Further, it would seem to possess hygienic advantages by lessening the risks of infection. At the present time, if employed on a large scale, this permanganate treatment would be somewhat expensive, but there appear to be good grounds for recommending its employment, if not universally, at least in severe cases where facilities for proper nursing and attention are lacking. It is hoped that medical officers in the tropics will give it a systematic trial and report their experiences with it.

[1] According to W. Dreyer, this treatment should be used with care in cases suffering from actual heart disease, or from cardiac weakness the result of the small-pox infection.

I may say that as a result of this note several reports have been received from colonial and medical officers testifying to the value of Dreyer's method in their native cases.

The late Dr. C. J. Baker, of Uganda, records a case which was not confluent, but in which the eruption was fairly extensive. The salutary effect of an application of a 3 per cent. solution of potassium permanganate all over the body in the earlier papular stage was most marked. Dr. Baker in his report says:—

> The patient suffered very little discomfort, and expressed profuse gratitude for the treatment, which is rare in natives. The attendants, who had had a great deal of experience in nursing small-pox cases, were much impressed with the result. The application was repeated daily. There was practically no scarring.

Dr. P. S. Selwyn-Clarke, in his monograph on small-pox in the negro of British West Africa, writes as follows:—

> Several experiments were carried out with varying strengths of aqueous solutions of permanganate of potash, painted over the body by means of pledgelets of cotton-wool at different stages of the eruption. When applied in the macular stage of the disease these solutions did not appear to influence the severity of the eruption. On the other hand, beneficial effects were so apparent when the solution was used prior to the rupture of the pustules—possibly owing to the mildly antiseptic effect produced—that this method of treatment became very popular amongst the patients and their friends and attendants, and the available supply in the dispensary of the Native General Hospital was temporarily exhausted. Half-saturated solutions applied two or three times daily gave a good result. Permanganate solutions, in addition, applied after the rupture of the pustules undoubtedly hastened cure and desquamation.

Finally, Dr. J. S. de Sousa, acting principal medical officer, Zanzibar, speaks favourably of the use of a 5 per cent. solution in definitely discrete cases. He found it of less service in confluent cases, and therefore modified the method by placing such patients in a long bath filled with 5 per cent. permanganate solution at body temperature for ten minutes to a quarter of an hour twice daily. He states that this procedure greatly reduced smell and sloughing, rendered the patients much more comfortable, and appeared in one or two cases to save life.

Of course, small-pox in this country, properly nursed under good hospital conditions, is unlikely to assume the exceedingly serious aspect it frequently presents in the tropics. Even so, however, confluent small-pox is always a dangerous and disgusting disease, and any method of treatment likely to prevent its spread, mitigate its severity, alleviate suffering and render the work of nurses and attendants easier and more pleasant deserves careful trial.

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I am, Sir, yours faithfully,

ANDREW BALFOUR.

Wellcome Bureau of Scientific Research, Nov. 25th, 1922.

ACUTE SUFFOCATIVE ŒDEMA OF THE LUNG.

To the Editor of THE LANCET.

SIR,—In reply to the remarks made by Dr. F. de Havilland Hall in a letter to THE LANCET of Nov. 11th on this subject, may I say that I am well aware of the recommendation of the use of atropine; although it was apparently successful in the case he quotes, the usual experience of those who have treated similar cases is by no means similar to that of Dr. Hall's. But really what I particularly wished to draw the attention of the profession in these cases to, was that there are two distinct clinical types—viz., those like Dr. Hall's case: people over 40 years of age, in which organic disease exists, especially aortic valvular regurgitation, accompanied often by nephritis of the granular type; and those cases which are much rarer, occurring in young people, in which no organic disease is discoverable. The explanation of the cause of this œdema I suggested was that of an aborted pneumonia, in which the congestive stage is fully developed, then the disease stops, to end either in rapid recovery, or in rapid death, generally the former. In my own case quoted I gave reasons for this view.

I am, Sir, yours faithfully,

Folkestone, Nov. 24th, 1922. W. J. TYSON.

THE ANATOMY AND SURGICAL BEARING OF THE NERVES FOUND IN THE ABDOMINAL WALL.

To the Editor of THE LANCET.

SIR,—The paper with this title, by Mr. R. Coyte,[1] has, I am pleased to see, been criticised by you in a leading article in THE LANCET of Nov. 25th. In the introduction to the surgery of "the acute abdomen"[2] the structure of the abdominal wall was specially described and illustrated, and the young operator advised to avoid certain lines of incision because of their liability to be followed by hernia. This was not in every instance because the nerves were liable to be injured by these incisions, although the question of the possible damage which might be caused by paralysis consequent on such injury was not overlooked. I would, however, avoid a discussion as to the effect of interference with nerve-supply in other parts, and ask permission to enter a protest against Mr. Coyte's statements under the heading (2) Appendicectomy. Under this he states: "Battle's para-rectal incision for appendicectomy and the muscle-splitting in the right iliac fossa both frequently give rise to considerable weakness of the abdominal wall, and occasionally to a definite hernia. This result can be avoided by paying proper attention to the anatomy of the nerves." It is also stated that "the para-rectal incision is usually made along the outer border of the rectal sheath."

As regards the question of weakness or hernia supervening after the para-rectal operation, I think it would be only fair if the writer were to give facts, and not make a general statement which is misleading on a matter of considerable importance. Having practised the operation for some years, during which one has looked for such, I have no doubt that if hernia were only occasionally seen, it must have come under my notice.[3] As it is, I have only encountered one. The case was that of an agricultural labourer, muscular and very fat, who had much vomiting following the administration of the anæsthetic, and tore out the sutures in the posterior incision so that omentum entered the sheath of the muscle and caused a forward bulging. This was not apparent for some weeks, when repair of the abdominal wall effected a cure. There was no question of damage to the nerves. Two other instances of bulging, probably due to a similar cause which required no operation, have been seen in considerably over 1000 cases. Again I find it difficult to understand the statement that it "frequently gives rise to considerable weakness." This is certainly an exaggeration also. It does not occur if the nerves are uninjured. My experience of cases when a nerve (or nerves) has been injured, or even divided, is that weakness may ensue for a time, but that this is not by any means permanent. The explanation being that the nerves to the rectus enter from the side and their distribution is not limited to a single section of the muscle, but is distributed up and down. The muscle being thus favourably served in case of injury to a portion of its nerve-supply.

There is a statement in the same section of the paper that the para-rectal incision is usually made along the outer border of the rectal sheath. I cannot, of course, know what operators the writer of the paper has watched, but if the operation is performed according to my original suggestion, the incision of the sheath should be made an inch or more internal to the outer border; one of the objects of the operation being to leave an intact muscle between the anterior and posterior lines of the sheath when the operation is completed. If the patient is not kept unnecessarily in bed after the operation, no restraint on movement enjoined, and the use of abdominal belts avoided, there should be no resultant weakness.

Those who have practised the muscle-splitting operation can speak about the results which they have obtained, and say if they are in agreement with Mr. Coyte; my attention has not been given to that method in any special way. If the linea semilunaris is selected, then the results as regards the subsequent formation of a hernia are very unsatisfactory. Some operators have not followed the steps which I endeavoured to impress on those practising the para-rectal incision, and it is not surprising if they have not obtained the success of those who have done so. Unfortunately their failure has resulted in bringing some discredit on the operation which is undeserved.

I am, Sir, yours faithfully,

Nov. 27th, 1922. W. H. BATTLE.

[1] THE LANCET, 1922. ii., pp. 1065, 1066.
[2] The Acute Abdomen, p. 3, 2nd edition, Battle.
[3] THE LANCET, 1921, i., 318. Surgical Diseases of the Appendix Vermiformis, p. 82, 2nd ed., Battle and Corner.

THE MECHANISM OF THE COCHLEA.

To the Editor of THE LANCET.

SIR,—I think the point raised by Dr. E. W. Scripture in his letter of Nov. 18th is a good one. If it is the same point that he intended to raise in his first letter, in which he referred to the analysis by the cochlea of vowel sounds, I must admit that I misunderstood his meaning.

He instances the case of a Savart's wheel which is being speeded up. None of the succeeding intervals between the blows of the toothed wheel on the card are the same, and yet we perceive a rising tone. The explanation I should offer is as follows. At the present day no one maintains the view of the cochlea resonator (often, though wrongly, attributed to Helmholtz) that pure tones excite the vibrations of a single fibre of the basilar membrane. It is recognised that there must always be vibration, though to a smaller extent, of the fibres lying on either side of the maximum point of stimulation. The disturbance of the basilar membrane resulting from a pure tone thus takes the form of a standing wave, the crest of which corresponds to the position of maximum resonance. Pitch is distinguishable in proportion to the sharpness of the crest of the standing wave. According to Gray's theory of the perception of *noises*, which appears to me to offer the best explanation of the facts, the effect on the basilar membrane of noise is the production of a standing wave or waves of comparatively wide extent and without any marked crest. Noises have thus a range, or ranges, of pitch, but the pitch is not well defined.

Now both the syren and Savart's wheel give a succession of noises. The effect of the first noise will be to cause one or more areas of the basilar membrane to vibrate. The second noise will damp out a number

of the vibrations of those fibres whose periods lie well outside the period intervening between the first and second noise. If the period between the third and second noise does not differ too much from that between the second and first, those fibres of the basilar membrane whose periodicity corresponds to this period will still be vibrating when the third impulse reaches them, and this vibration will be reinforced, whilst a further number of outlying vibrations will be damped out. The process will be repeated with each succeeding impulse. Thus the crest of the standing wave will tend to become better defined, and to move up the scale in correspondence with the successive shortening of the interval between the impulses. The sensation of a rising tone will be produced.

I am quite conscious that the subject of sound perception is a difficult one, and that many of its details remain obscure. I do not think that the resonance theory can either be established or disposed of in a summary manner or by any single convincing argument. The question must be studied in all its bearings. In delicate adjustment and balance of mechanical factors the cochlea is probably the most refined piece of mechanism with which we are acquainted. Yet I venture to think that in the light of the resonance hypothesis the relation of function to structure is at least as clearly traceable in the cochlea as is the connexion between the machine and its working in other parts of the body. Could we, for instance, deduce the song of the birds from a study of the syrinx, or the complexities of human speech and song from the anatomy of the larynx and upper air-passages?—I am, Sir, yours faithfully,

Sheffield, Nov. 22nd, 1922. G. WILKINSON.

PANCREATIC EXTRACT IN DIABETES.

To the Editor of THE LANCET.

SIR,—In THE LANCET of Feb. 27th, 1909, you published an article by me on the successful treatment of diabetes in a young girl with "whole" extract of the pancreas given by the mouth. In the *Dublin Journal of Medical Science* for May, 1910, appeared a further paper by me on a New Pancreatic Extract for the Treatment of Diabetes. This extract was made for me by Messrs. Fairchild, the process being the heating of the press-juice of fresh pig's pancreas to 80° C., which precipitated the proteins and destroyed all the external secretions, leaving the internal secretion intact. I obtained very encouraging results with this given by the mouth, distinctly more carbohydrate being utilised, and there was a manifest increase in the feeling of well-being of the patients. Further, it was powerful enough in internal secretion when injected to arrest the oncoming symptoms of coma.

It never occurred to me as practical, nor does it now, to treat such cases by giving injections three times a day. Will it never be generally realised that the important thing is the amount of food materials—carbohydrate, fat, and proteins—utilised that matters, not the amount excreted? In my first paper I stated that the lesion in the pancreas was microbial in origin, and have always taught so since. I am glad this is now accepted. In my paper, the Nature of the Internal Secretion of the Pancreas (*Dublin Journal*, July, 1921), I showed that the internal secretion was not a hormone in the proper sense of the word, but was an essential part of a compound ferment, the heat-labile part of which was produced by the tissue cells.

The Toronto workers can, therefore, not claim priority of the idea to produce a pancreatic extract containing the internal secretion alone; nor can they claim priority of the idea to destroy the external ferment-producing cells by occlusion of the duct—this was a well-known method; nor did they invent the pancreas or its cell-islands.

I am, Sir, yours faithfully,

W. M. CROFTON.

University College, Dublin, Nov. 27th, 1922.

"MORCELLEMENT" OF TONSILS.

To the Editor of THE LANCET.

SIR,—As the translator of "Oto-Rhino-Laryngology" by Georges Laurens, may I be allowed to make a few remarks on the review of this work, which appeared in your issue of Nov. 18th? "Morcellement" for the removal of tonsils is, I agree, not so much in favour, save in specially selected cases, here as in France. During the past 15 years I have enucleated over 1400 pairs of tonsils, but only in 5 per cent. of the cases was the morcelleur used, the practice adopted being complete removal with the guillotine in the case of children, and by dissection in adults. I much regret not having inserted a footnote anent the subject in the translation. With very few other exceptions, the methods of treatment as set forth are those adopted in this country.

I am, Sir, yours faithfully,

New Cavendish-street, W., Nov. 23rd. H. CLAYTON FOX.

INTESTINAL WORMS AND PERITONITIS.

To the Editor of THE LANCET.

SIR,—The article in THE LANCET of Nov. 18th by Dr. W. Nicoll, entitled Observations on the Occurrence and Prevalence of Parasitic Intestinal Worms during the War, seems to throw some light on the cause of the death of Herod as recorded in the Acts of the Apostles. The account of Josephus is (I quote from memory) that "Herod was seized with a violent pain in his belly and died five days afterwards." If we assume that Luke refers to *intestinal* worms the two accounts would tally. In an age and in a clime in which embalming was so prevalent the average physician must have had considerable knowledge of the morbid anatomy of the abdomen and would not be likely to err on the side of attributing too few deaths to intestinal parasites. We appear to be on safe ground if we conclude that Josephus supplies the faithful description of an intelligent layman, while Luke furnishes an accurate certificate of death in harmony with the most recent pathology.

I am, Sir, yours faithfully,

Belfast, Nov. 20th, 1922. R. M. FRASER, M.D.

THE MERITS OF PROPORTIONAL REPRESENTATION.

GENERAL ELECTION, 1922—COMBINED ENGLISH UNIVERSITIES.

To the Editor of THE LANCET.

SIR,—The methods of counting votes under the system of Proportional Representation used at University contests are puzzling in their application. The votes cast for me were many more than the officially recorded 90. I do not suppose that I was credited with a single vote from the members of the Conservative Graduates Association, who put me up for election! They had been urged to vote for "Faraday and Lawrence"; what more natural than to vote Faraday 1, Lawrence 2? My recorded poll of 90 consisted of "plumpers," or first preferences. Whilst I was unable to receive any addition whatever to my poll from any second preference votes given to me, in the course of four subsequent counts, the totals of other candidates received large additions from that source and (I believe) later preferences. Sir Martin Conway did not reach his quota until after Lawrence and Faraday votes had been transferred and a third count made. Mr. Fisher did not arrive at the same goal until after the transfer of votes for Lawrence, Faraday, and Woolf, and a *fifth* count had been made. The fourth count was concerned in distributing the surplus of Conway votes which originally had been mostly first preferences for my colleague Faraday! My first election experiences leave me in doubt whether the "Proportional Representation" method of voting and counting votes is as perfect and just a system as its advocates allege.—I am, Sir, yours faithfully,

SIDNEY C. LAWRENCE, M.B. Birm.

Bournemouth, Nov. 21st, 1922.

Obituary.

FREDERICK BRYAN, M.B. DURH.

THE death of Frederick Bryan, which took place some time ago when visiting Garve, Ross-shire, came as a painful surprise to his friends, but has passed almost without general notice. An attack of angina pectoris came on at night, quite without warning, and although he rallied for a short time, a second seizure proved fatal.

Bryan joined St. Thomas's Hospital as a student in 1879, having come from Melbourne, his native city, where he had been educated at the Scotch College. His voyage to England was round the Horn in one of the old clipper ships, and formed the subject of many interesting stories in later life. At St. Thomas's he early made his mark as a good athlete, and was one of the best full-backs in the history of the hospital Rugby team. He was also an all-round cricketer, becoming a playing member of the M.C.C. Later he was known as a golfer, and an excellent shot, in fact, he had an unusual aptitude for any sport requiring a good eye, skill, and strength. After qualification (in 1884) he became a resident at the Bethlem Royal Hospital, and was for a few months a resident at the Leicester Royal Infirmary. Having decided to devote himself to the practice of mental diseases, he joined the medical staff of the Metropolitan Asylums Board, and became assistant medical officer to Colney Hatch Asylum, where he remained until he had attained the position of senior assistant. When at this asylum he was mainly instrumental in obtaining from the authorities a ruling which enabled the superintendent (or other responsible medical officer in his absence) to call in special surgical help from outside when he considered it necessary. The want of this had previously, especially in urgent cases, been the cause of grave concern to the medical officers and dangerous delay to the patient.

From Colney Hatch Asylum he was transferred to the new asylum at Horton, and was superintendent of the Horton and later of the Manor Asylums until his retirement. His practical knowledge and unfailing energy proved of great service to the committee of the Board in the inauguration and arrangement of these large undertakings. After leaving the Horton and Manor Asylums he went into consulting practice in Harley-street, but gradually retired to Guildford, where he made his home, but continued to practise his specialty. His name will be honoured by many medical men with whom he was brought into contact, but few of them knew the real kindliness of his character, although they appreciated his extensive practical knowledge of mental diseases.

Dr. Bryan was married, but had no children. Bequests were made in his will to the trustees of the Scotch College, Melbourne; the public library, Melbourne, and the University of Melbourne.

CHRISTOPHER VISE, M.D. DURH., M.R.C.S.

DR. CHRISTOPHER VISE, senior physician of Tunbridge Wells General Hospital, died on Nov. 14th, aged 65. He was born at Holbeach, and, the son of a doctor, was the descendant of doctors who have practised in Lincolnshire for some 200 years, being of the eighth generation of one family of practitioners. He was educated at University College school and medical school, and at Durham University. He qualified M.R.C.S. in 1880, and graduated M.B. Durham in 1882, proceeding to the M.D. degree two years later. He held appointments at the Hospital for Consumption, Brompton, and at University College Hospital, and had been assistant demonstrator of anatomy at the University of Durham. He was also for a time on the staff of the Mount Vernon Hospital for Consumption. Previous to his appointment on the staff at Tunbridge Wells he had been for five years resident officer at the hospital.

As early as 1893 Dr. Vise was gazetted to the old Kent Volunteer Battalion and at the outbreak of war he was already in receipt of the Territorial Decoration on the completion of 20 years' service. When employed in 1914 he served as medical officer of the 4th Battalion of the Queen's Own Royal West Kent Regiment, and in the 5th Battalion of the Buffs, while throughout the last two years of the war period he was placed in charge of the military hospitals at Doncaster and Worksop, finishing his services on the Headquarters Staff of the Northern Command at York.

We have received from Sir StClair Thomson, a life-long friend, the following tribute to his memory:—

"When giving my presidential address before the Medical Society of London in 1917 I pointed out that when the Society was first founded in 1773 Latin was the official language, and that the Society was fortunate in possessing a copy of the Original Form of Nomination. This copy is dated 1789, and is addressed to William Vise, Surgeon at Spalding in Lincolnshire. The Latin form is printed and the translation accompanying it is in the handwriting of William Chamberlain, the celebrated obstetrician, whose name is well known in connexion with the invention of midwifery forceps. The election to the Society is addressed to "Viro Celeberrimo Gulielm. Vyse," and ends with the expression "Vale ac vobis fave." At my suggestion this interesting memorial was presented to the Society by Christopher Vise, the great-grandson of the original recipient.

"Christopher Vise, like myself, commenced the study of medicine by being apprenticed to a practitioner. We were both pupils of the well-known Tom Walker at the infirmary at Peterborough. From there he went to University College and was a contemporary with Victor Horsley, Bond of Leicester, Sir Henry Maudsley of Melbourne, and others who made good at that brilliant period in the history of University College. Here, as later in all the relationships of a busy life, Vise made friends; he never had an enemy wherever he went. His guileless spirit, his genial manners, and his radiant personality suggested to many who met him some of the most attractive characters in Dickens. His affability, his goodheartedness, and his appearance of robust health often led to undue calls upon his time and patience. But he stuck to all his duties, although he had long been aware of some defects in his metabolism. Only last July, at the meeting of the British Medical Association in Glasgow, he was making new friends and being welcomed by all who had ever met him before. For the time being there is a hiatus in the long succession of the family of doctors to which he belonged. But his memory will long be treasured as that of one of the sincerest and kindest of men."

Dr. Christopher Vise married the daughter of the late Major-General Andrew Monro, and is survived by a widow and three sons.

JAMES ANDREWS, M.D. ST. AND.

WE have already announced the death on Nov. 17th at Hampstead of Dr. James Andrews in his ninety-third year. Born at Pershore, he served, as was then the custom, an apprenticeship in his native town and entered as student at Guy's Hospital in 1848. At this time Aston Key was at the height of his career, and Addison and Bright were active members of the staff. Dr. Andrews was dresser to Bransby Cooper, and after taking the M.R.C.S. and L.S.A. in 1851 and the M.D. St. And. in 1854, commenced practice in the Camden-road. In 1872 he removed to Hampstead and continued in active practice there until his retirement in his eightieth year. He knew and had interesting reminiscences of most of the consultants of the last century, his greatest admiration being for Sir Thomas Watson. To the last he retained all his faculties and took a keen interest in modern developments both in medicine and public affairs.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

THE winter session of the General Medical Council was opened on Nov. 28th under the presidency of Sir DONALD MACALISTER. Unless the penal proceedings should be protracted the session promises to be a short one.

THE PRESIDENT'S ADDRESS.

The PRESIDENT began by regretting the retirement from the Council of three distinguished members. Sir Norman Moore has resigned office after 21 years' service as representative of the Royal College of Physicians of London, and is succeeded by Sir Humphry D. Rolleston, the present President of the College. Dr. J. C. McVail, the Crown member for Scotland, is retiring at the close of his second term of five years, and is succeeded by Sir W. Leslie Mackenzie, a medical member of the Scottish Board of Health. Prof. Roy Dean, lately the representative of the Victoria University of Manchester, is retiring on appointment to the pathological chair at Cambridge. He is succeeded by Dr. R. B. Wild, Professor of Materia Medica and Therapeutics in the University of Manchester.

International and Dominion Reciprocity.

On the subject of reciprocity the President announced that for the time being the reciprocal relations with Belgium, which had subsisted during the war, must remain in abeyance, while no further communication, he said, had been received regarding reciprocity with Spain. In Canada, the Dominion Medical Act is not yet in full operation, so that separate agreements for reciprocity have had to be made with individual provinces, giving rise to certain administrative difficulties. It is hoped that some generally applicable form of agreement satisfactory to the Council, to the Provinces of Canada, and to the Dominion Medical Council will shortly be arrived at.

The President continued:—

Midwifery Training in India.

The report of Dr. Norman Walker on the midwifery training and examinations required for Indian medical degrees registrable in this country, and the resolutions of the Executive Committee thereupon which were adopted in May, 1922, were duly transmitted to the Secretary of State for India, and communicated by him to the Government of India. The Secretary of State invited that Government to nominate, for approval by the Council, an officer suitable for the appointment of official inspector of the Universities of Bombay, Calcutta, Punjab, and Lucknow, in respect of midwifery. The University of Bombay has in the meantime made certain important changes in its regulations, with the object of bringing them into conformity with the Council's recommendations on the subject. The Government of India has now nominated, and the Secretary of State has recommended the appointment of Lieut.-Colonel R. A. Needham, C.I.E., D.S.O., who was associated with Dr. Norman Walker during his visit to India, as official inspector of the Universities mentioned. The Executive Committee has had pleasure in intimating on behalf of the Council its cordial approval of the appointment, and trusts to receive a satisfactory report in time for consideration on the next session.

The New Educational Recommendations.

The devoted labours of the Council, and of its committees, before and during its last session, enabled it to complete and approve for publication its new resolutions and recommendations, relating respectively to the registration of medical and dental students, the courses of study for medical and dental qualifications, the conduct of professional examinations, and the rules for diplomas and degrees in public health. In a sense our educational work is thus for a time accomplished, and the duty of discussing new schemes of professional study and examinations now lies upon the Licensing Bodies. So far as I can learn the discussion is going forward actively; but some time must pass before the bodies are all in a position to formulate and publish the changes they propose to make in their curricula. They recognise, I am glad to say, that our single aim is, in the light of modern conditions, to improve medical education, and that the method we employed, that of full and free consultation with teachers and teaching institutions, followed by equally full and free debate in this Council, in which all the medical faculties and corporations are represented, was that best adapted to produce results valuable in themselves and generally acceptable to the profession. Our resolutions, in fact, are the expression of a *concordat* amicably reached, not of an ordinance framed and issued by external authority. For that reason our schemes will assuredly commend themselves to the authorities concerned, and each will be considered by them as a connected and coördinated whole, even where opinions may reasonably differ on this or that minor detail.

In the case of a student whose matriculation or other preliminary examination has included chemistry and physics as subjects of *general* education, the regulations make it clear that the pre-registration test must be *in addition* to the matriculation test in general education, whatever subjects that test may have included. The latter must be complete in itself, and the pre-registration examination must be supplementary to it.

A student intending the Faculty of Medicine is, therefore, to complete his school course of general education up to the same level as his fellows intending the Faculties of Arts or Pure Science. That foundation being secured, he is to acquire, in addition, such further knowledge of chemistry and physics as will enable him, immediately after registration, to take up intelligently the study of these sciences *in their application to medicine*. By raising the age of registration by one year, the Council made room, as it were, for the special supplementary equipment which the intending student of medicine needs, if he is to enter on the revised curriculum with profit.

The Inspection and Visitation of Qualifying Examinations.

The President reported that in the University of London a second inspection of the examinations in midwifery has shown that certain changes have been made in the regulations and arrangements, which are regarded by the Examination Committee as improvements. In the case of Cambridge, where similar improvements have not yet been brought into operation, the Committee recommends that a third inspection or visitation of the midwifery examination shall be held in December.

TUESDAY, NOV. 28TH.

After the conclusion of the President's address the Council proceeded to the consideration of penal cases, the number of which is unfortunately large. It is noticeable that none of them relate to practitioners on the Dental Register. Six cases were dealt with and two names were erased—those of Sydney Firth, registered as of Corner House, Ropsley, Grantham, convicted at Lincoln Assizes in June, 1922, of four separate felonies (the felony in each case being an attempt to procure miscarriage) and now undergoing seven years' penal servitude; and of William Young, registered as of Inverdeen, Usworth, Durham, several times convicted of misdemeanours relating to drunkenness when in charge of a motor-car. Mr. Young did not appear before the Council, and had returned no reply to communications addressed to him relating to his case, which was adjourned from May, 1922.

TUBERCULOSIS SOCIETY.—An ordinary meeting of this Society will be held at the Margaret-street Hospital, Margaret-street, London, W. 1, on Monday, Nov. 27th, at 7.30 P.M., when Dr. J. Campbell McClure will read a paper on the Association of Bronchitis with Pulmonary Tuberculosis.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

FIVE PROVINCIAL BOROUGHS.

THE following table gives the principal health statistics of five provincial boroughs.

Name of town.	Estimated population (R.-G.).	Birth-rate.	Death-rates per 1000 of population				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory and influenza.	Infant mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality in childbirth.
Salford ..	239,100	25·2	13·9	1·6	1·0	3·7	107	25	3·5
Bolton ..	182,200	21·0	12·8	1·1	1·2	2·8	96	13	4·4
Derby ..	131,800	22·8	11·3	0·9	1·3	2·3	69	10	2·0
Walsall ..	98,800	28·0	13·4	1·1	0·8	2·5	113	26	3·6
Wigan ..	91,200	27·7	14·3	1·2	0·6	3·0	116	32	4·3

Salford.

Dr. C. H. Tattersall, in submitting his last report as medical officer of health, states that a great deal has been done in getting repairs to property carried out, but that owners still show strong disinclination to look after their property as efficiently as before the war. Dr. Tattersall reports also much work in the way of smoke observations, resulting chiefly in cautions, there being only one fine (of £1). In view of Salford's high rate for respiratory diseases, shown in the above table, the authorities may perhaps be considered too lenient to this nuisance. Cases of enlarged tonsils in the schools are re-examined after a month's interval before surgical measures are decided upon. Children suffering from ringworm and treated by X rays usually return to school five weeks after the application, whereas with other methods of treatment they do not return for many months or as long as two years. Owing to shortage of staff the school dentists devote most of their time to the conservative treatment of the six-year-old molars. The veterinary inspector's report shows that 19 of 284 mixed milks, or 6·7 per cent., contained tubercle bacilli. On ten of the 19 farms tuberculous udders were found. In the case of the other nine farms cows had been sold during the month between the taking of the sample and the receipt of the verdict. Of eight samples of cream examined one contained tubercle bacilli. There are only stalls for 170 cows in the borough cowsheds, but these 170 stalls furnished three tuberculous udders during the year and one cow wasting from generalised tuberculosis.

Bolton.

Dr. C. W. Paget Moffatt, who submits the report, was tuberculosis officer and acting medical officer of health from May, 1921, onwards during the illness of his predecessor, Dr. J. E. Gould, and was formally appointed medical officer of health on Dec. 1st. He reports that the tuberculosis dispensary fulfils its proper function as a place for consultations and special treatment. No treatment of symptoms with ordinary drugs is given, but only special forms of treatment such as tuberculin and colloid calcium. Tuberculin is only used for "surgical" tuberculosis and is said to have given excellent results in many cases. The Haslam Maternity Home (20 beds) has been greatly appreciated. The number of confinement cases during the year was 150, with no puerperal sepsis, no ophthalmia neonatorum, and no maternal deaths. Of the seven still-births, four were macerated, two were breech presentations, and one in connexion with placenta prævia. The number of cases where the infant was not breast-fed is very large. Dr. Moffatt reports that Bolton is being gradually converted to the water-carriage system, but that there are still 11,665 privy-middens and pail-closets to be dealt with.

Derby.

Dr. A. E. Brindley reports that a special inquiry was made in March with respect to anthrax-infected shaving brushes. Two were found: One, a bone-handled brush marked "Made in Japan," was the only one in stock and was destroyed, the retailer undertaking to purchase no more brushes of this type. The second was retailed at 3*d*. and was one of many others which were all withdrawn from sale. In October 25 cases of poisoning from pork pies occurred in Derby and simultaneously there were cases in Heage, Melbourne, and Belper. The pies came from one of the best-known and best-managed establishments in the town. The symptoms were pains in the stomach, violent vomiting, and diarrhœa with more or less pyrexia. All the patients recovered. Bacteriological investigation apparently afforded no clue to the exact reason why the pork pies became poisonous. Dr. Brindley is of opinion that these cases will occur from time to time, even in well-managed establishments, unless the making of pork pies and sausages is carried on in buildings quite detached from slaughter-houses and places where gut-cleaning is carried out. Dr. Mary Bird, the maternity and child welfare medical officer, has given addresses to the midwives during the year, followed by discussions. Incubators were used for 14 babies. The ante-natal clinic shows a great increase in attendances. No less than eight out of 49 mixed milks coming from outside farms contained tubercle bacilli. Tuberculous udders seem to have been found on only two of the eight farms, but in one case a waster with inflammation of the udder had been sent to the knacker, and in another case a cow "which had not been doing well" had been sold in the market between the taking of the sample and the receipt of the biological verdict. In a third case the farmer was in the habit of mixing his milk with that from another farm. One of the cows with a tuberculous udder was sold, not in Derby, and the vendor said he did not know the name of the purchaser. Particulars are not given of the seventh and eighth cases, but the Derby experience is one more illustration of the need for the strengthening of the law with regard to tuberculous udders and "wasters."

Walsall.

Dr. Harry Shore thinks that the increase in infant mortality from 101 in 1920 to 113 in 1921 was partly due to climatic but chiefly to social conditions resulting from unemployment and the coal strike. He thinks that the reduction in the amount of milk distributed by the council to expectant and nursing mothers and infants is unwise economy. The housing question, he says, presses more strongly than ever. He pays a tribute to the band of voluntary welfare workers who have kept up their enthusiasm under most trying and discouraging circumstances.

Wigan.

Dr. Henry Whitehead expresses his opinion that the high infant mortality of Wigan is due to the large number of privies and pail-closets and the enormous accumulations of human excreta at Miry-lane depôt, to the unsatisfactory methods of removing refuse, to the limited scheme of maternity and child welfare work, to insanitary and overcrowded houses, and lastly, to ignorance and carelessness of parents. Since the passing of the Wigan Corporation Act, 1921, a scheme is in sight for the adoption of the water-carriage system. In the summer months of 1921 the diarrhœa death-rate in Wigan was greater than in any other large town. There was also an increase in the cases and deaths from enteric fever. During the coal crisis about 3000 persons were at one time supplied with free milk, and even after the numbers had fallen Dr. Whitehead estimates that one-third of the health visitors' time was taken up in income investigations and clerical work to prevent abuse of the free milk

scheme. A maternity home is badly needed. Dr. Whitehead considers that at least 2500 houses are also needed, towards which 100 have been completed. The borough's scheme is for the provision of 185. The improvements instanced as being necessary by Dr. Whitehead throughout the report show that the health authority of Wigan has a big task before it if the town is to be brought up to modern standards.

Medical News.

UNIVERSITY OF LONDON.—A course of five lectures on the Nature of Ultra-Microscopic Viruses will be given by Dr. F. W. Twort in the theatre of the Royal College of Surgeons, Lincoln's Inn-fields, London, W.C., on Dec. 11th, 12th, 15th, 18th and 19th, at 4 P.M. Admission will be free without ticket.

At examinations held recently the following candidates were successful:—

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

With special knowledge of Psychiatry.—Henry E. L. Canney, Geoffrey F. Cobb, Robert D. Gillespie, Douglas I. O. Macaulay, David Matthew, Harry M. North, and William R. Page.

The following degree was awarded by the Senate on Nov. 15th:—

B.SC. DEGREE BY RESEARCH FOR INTERNAL STUDENTS.

Physiology.—Edward C. Dodds, Middlesex Hosp.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH: *Higher Dental Diploma.*—The following candidates, having passed the requisite examinations, received the Higher Dental Diploma:—

Frank Harold Birch, L.D.S. U.Lpool; Robert Murray Fraser, L.R.C.S.E. (Triple), L.D.S.R.C.S.Edin., and Marshall Newton Goold Fallas, L.D.S.R.C.S. Edin.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An extraordinary Comitia of the College was held on Nov. 24th, with Sir Humphry Rolleston, the President, in the chair. Licences to practise physic were granted to Cyril Rickwood Lane and Ella Kennedy Will. Permission was granted to the "Museum Galleries" to photograph certain oil paintings in the possession of the College. The Dean of the Middlesex Hospital Medical School applied for permission for a copy to be made of the portrait of Sir Thomas Watson. This was granted subject to the condition that the portrait should not be moved from the College while it is being copied. Mr. Percy Bigland, who painted the portrait of Sir Samuel Wilks, now in the College, asked permission to exhibit it at the Corporation Gallery, Hull. Permission was given for three months. Dr. R. A. Young wrote tendering his resignation of the office of Examiner on his appointment to the Committee of Management. This was accepted as from next July. The President announced that Dr. Kenneth N. G. Bailey had been appointed as Streatfeild Research Scholar. Dr. H. G. Turney was appointed as representative of the College on the council of the Queen's Jubilee Fund for Nurses, vice Sir Dyce Duckworth, resigned. Sir Humphry Rolleston was elected representative of the College on the General Medical Council, vice Sir Norman Moore, resigned. The President then dissolved the Comitia.

INTERNATIONAL COMMITTEE ON ANTHRAX.—The International Advisory Committee on Anthrax, set up in accordance with a resolution of the third session of the International Labour Conference held at Geneva in 1921, will meet in London on Tuesday, Dec. 5th, under the chairmanship of Sir William Middlebrook. The terms of reference to the Committee are to inquire into: 1. The problem of the disinfection of wool and hair infected with anthrax spores in all its bearings, and to report thereon to the governing body of the International Labour Office in time for consideration by the 1923 International Labour Conference. 2. The practice and effective methods of preventing infection among flocks, and to report thereon to the 1923 conference. 3. The possibilities of dealing with infection by anthrax from hides, skins, and other materials. The following experts have been nominated by their Governments as members of the Committee: Sir Thomas Oliver (Australia), Dr. Gilbert (Belgium), Mr. Boulin (France), Dr. Frey (Germany), Lieut.-Colonel Hutchinson (India), Prof. Loriga (Italy), Dr. Hoshiai (Japan), Mr. R. W. Dixon (South Africa), Prof. Roca (Spain), Mr. Ribbing (Sweden). The Government of the United States will be unofficially represented by Dr. M. Dorest of the U.S. Department of Agriculture. The Committee is prepared to receive representations by employers or workers on the questions covered by the terms of reference. These should be addressed to Sir William Middlebrook, c/o The International Labour Office, 26, Buckingham-gate, London, S.W. 1.

19TH C.C.S. DINNER.—The annual dinner will be held at the Imperial Restaurant, 62, Regent-street, London, on Friday, Dec. 15th. All those who were either members of or associated with 19th C.C.S. are invited. Tickets, 15*s.*, exclusive of wine, may be obtained from the Rev. E. C. Doddrell, 6, Alexandra House, Regent's Park-road, Finchley, London, N. 3.

PANEL COMMITTEE FOR THE COUNTY OF LONDON.—The annual dinner and dance will take place on Dec. 7th, at 7 for 7.30 P.M., at the Connaught Rooms, Great Queen-street, Kingsway, London, W.C. 2. Tickets, gentlemen 21*s.*, ladies 15*s.* (exclusive of wine), may be obtained from the secretary, Dr. R. J. Farman, at 51, Chancery-lane, London, W.C. 2.

CHELSEA CLINICAL SOCIETY.—The Chelsea Clinical Society inaugurates instead of closing its sessions with a dinner. The function this year was held on Nov. 22nd, at the Café Royal, Dr. Campbell McLure in the chair. If the success of future meetings may be divined from that of the dinner the society may anticipate a prosperous season. Among the guests were Sir Humphry Rolleston, Sir William Hale-White, Sir Sydney Russell-Wells, and Dr. Fortescue Fox. The two former replied in entertaining speeches to the amusing terms in which their health was proposed by Mr. Ivor Back. Further entertainment was provided by songs and pianoforte performances from Captain Radcliffe and Mr. Norman King. The President laid stress on the informal character of the society's ordinary meetings, the absence of printed transactions ensuring freedom of debate.

ROYAL DENTAL HOSPITAL DINNER.—The annual dinner of the Royal Dental Hospital was held on Nov. 25th. For many years it has been the custom of the hospital staff to collect together a large number of cases and specimens of dental interest and to throw open the hospital on the afternoon preceding the dinner to old students and their friends. A large number of dentists and doctors, among these the President of the Royal College of Surgeons of England, availed themselves of the opportunity of seeing the work of the hospital. The hospital has recently established a department for the treatment of speech defects for which there was much need for children with cleft-palates. Some of these children were present and showed how well they had profited by their instruction.

The dinner was held at the Trocadero Restaurant, Mr. Percy Webster being in the chair. Mr. Harry Stobie, the Dean, in replying to the toast of the Hospital and School, said that the school was in a flourishing condition. There were 299 students, of whom 43 were women. The entries for October had been satisfactory. The school had been continued as a school of London University for another three years. The results at the last examination had been good, 60 out of 70 obtaining their diploma. He alluded to the fact that a degree of Bachelor in Dental Surgery had been instituted by the University of London, which would require special teaching. The new regulations of the Royal College of Surgeons were now in force and should prove helpful. The students with Government grants, of whom there were several, were doing well. Mr. Clark, the radiologist, had resigned on reaching the age-limit. He had served the hospital for 14 years, a period which had seen a great extension of dental radiology, and no one had played a more important part in that change than Mr. Clark. The athletic side of the hospital was strong, but the students were much hampered by not having a sports ground of their own. The toast of "The Visitors" was responded to by the President of the Royal College of Physicians of London and the President of the Royal College of Surgeons of England. The former said that during the war the naval dental surgeon was the hardest worked man in the whole Fleet. He worked all day and was often filled up with appointments for weeks ahead. He alluded to the services of Mr. Clark to dental radiology, and said that his name and work were familiar to many medical men as well as to dentists. He had a great admiration for all that dentistry had done, and looked forward to a great future for it. The President of the Royal College of Surgeons of England offered his congratulations on the strides which the dental profession had made and is still making. He had been much impressed by the work of the dental surgeons in the war. There were none who worked harder. He said that the excellent training in anæsthetics given at the Royal Dental Hospital, and the experience which dentists had of nitrous oxide administration, had proved of great service to the R.A.M.C. in the war. He thought that dentists were more advanced in England than in any other country, and that a considerable share of credit for this belonged to the Royal Dental Hospital.

During the evening the prizes gained in the past year were distributed, and a musical programme was contributed by the students.

UNIVERSITY COLLEGE HOSPITAL.—The annual dinner of the Medical Society will take place on Tuesday, Dec. 12th, at Gatti's Restaurant, Strand, at 7.30 P.M. Mr. T. H. Somervell, F.R.C.S., who was a member of the Mount Everest Expedition this year, will be the guest on this occasion. Tickets, 10*s.* 6*d.* each, may be obtained from Mr. J. A. Hadley, the hon. secretary, at University College Hospital.

EPSOMIAN CLUB DINNER.—The annual dinner of this club will take place at the Trocadero Restaurant, London, W., on Dec. 14th, at 7.30 P.M. The price of the dinner will be 12*s.*, exclusive of wine, and will be collected at the table. Any members intending to dine are requested to notify the hon. secretary (S. Maynard Smith, 49, Wimpole-street, W. 1) as soon as possible, and to give the names of friends they wish to sit near, so that table plans may be prepared.

DURHAM UNIVERSITY COLLEGE OF MEDICINE.—A reunion dinner for graduates and undergraduates will be held in the County Hotel, Newcastle, on Dec. 14th, at 7 for 7.30 P.M. Mr. Cecil A. Cochrane will be the guest of the evening, and Prof. H. Brunton Angus will preside. Applications for tickets (undergrates, 6*s.*; graduates and others, 12*s* 6*d.*) should be sent to Mr. G. C. Parkin, College of Medicine, Newcastle-on-Tyne, on or before Wednesday, Dec. 6th.

SOCIETY OF MEDICAL OFFICERS OF HEALTH: *Maternity and Child Welfare Group.*—A meeting of the Metropolitan and Home Counties branch of this group will be held at 1, Upper Montague-street, Russell-square, London, W.C., on Dec. 12th, when Mr. Eardley Holland will read a paper on the Dangers of Breech Presentation to Fœtal and Infant Life. The meeting, which will begin at 5.15 P.M., is open to members of the medical profession.

UNIVERSITY OF VIENNA: FACULTY OF MEDICINE.—A post-graduate course will be held from Dec. 1th to the 16th. Lectures and demonstrations will be given on progress in surgery, orthopædics, urology, midwifery, and gynæcology, with special regard to treatment, by the most prominent Austrian professors. The bureau of the course is in the house of the Gesellschaft der Arzte, Wien IX., Frankgasse 8, where those who intend to follow the course should present themselves before attending any lectures. The fee for the whole course is 10,000 kronen for Austrian and German subjects; 50,000 kronen for subjects of Bulgaria, Jugo-Slavia, Poland, Roumania, Russia, Czecho-Slovakia, and Hungary; and 100,000 kronen for members of other nationalities. Those desirous of taking the course should communicate with the secretary, Dr. A. Kronfeld Wien IX., Porzellangasse 22, for further particulars and for information as to lodging.

A further course on Diseases of the Skin and Venereal Diseases, with special reference to treatment, will be held from Feb. 12th to 24th, 1923.

THE MAUDSLEY HOSPITAL.—The attention of readers is called to the provision made by the London County Council for the combined treatment on a voluntary basis of nervous disorders, whether functional or organic. The Maudsley Hospital at Denmark Hill is the first institution founded in this country on the lines of the neurological and psychiatric clinics, familiar on the continent and in America. It is intended primarily for the treatment of early and recoverable types of mental disorder, but also for observation of cases of unusual scientific interest and for study of psychological medicine by qualified practitioners. Regular arrangements will be made for clinical instruction and for lectures in preparation for the various diplomas of psychological medicine, and it is presumed that the hospital will become a recognised school of London University. Treatment will be under the control of a medical superintendent with four whole-time medical officers and a staff of clinical assistants, while modern laboratory methods of diagnosis and treatment are assured by association with the pathological department of the London County Mental Hospitals. Further particulars are as follows: Consultant and dental services will be available; the nursing of male patients will be almost entirely carried out by women; an out-patient department is arranged for four days in the week; and the in-patient accommodation, consisting of six wards with 144 beds in all, includes separate rooms and dormitories, where classification will be solely directed to the nature of the symptoms. A few private rooms will be available for female patients of larger means. Patients resident in the administrative county of London will be required to contribute according to their ability as at the voluntary hospitals. Those outside the area will be required to pay the full maintenance rate.

DENTAL BOARD OF THE UNITED KINGDOM.—On Nov. 21st, after the delivery of the chairman's address, which we noted in last week's issue, the registrar reported the restoration to the Dentists Register of seven names. A communication was then read from the Privy Council transmitting an Order in Council directing that Section 1 of the Dentists Act, 1921 (relating to the practice of dentistry by unregistered persons), should come into operation on Nov. 30th, 1922. The Board then considered a statement issued by the Board of Education with reference to the performance of minor dental work (under personal supervision by a registered dentist) by persons who are not registered dentists. On May, 1922, a committee of the Board was appointed to confer with representatives of the Ministry of Health, and, when satisfied, to express, on behalf of the Board, concurrence with a scheme for the control of such minor dental work. The Board resolved that the committee be empowered to deal with such questions as might arise, with regard to which the Board of Education might desire the counsel or assistance of the Dental Board. The Board then proceeded to consider the solitary penal case of the session—that of a registered dentist twice convicted of drunkenness and disorderly conduct. The Board postponed judgment until the November session of 1923, with the usual proviso as to satisfactory behaviour in the interval. The Board then received deputations from the Parliamentary Committee of the Coöperative Congress and from the British Dental Association in connexion with the employment of dentists by coöperative societies. The two deputations having been heard, the chairman suggested that a conference should be arranged between the two bodies, and stated that the Board would be willing to give any assistance which might help to bring about a mutual understanding. The Board then proceeded to the consideration, adjourned from May, 1922, of 17 cases of covering. In 16 of these cases, satisfactory evidence having been given as to conduct in the interval, the Board did not find that any name should be removed from the register. In the remaining case no declaration as to conduct had been sent in; judgment in this case was therefore postponed until the next session of the Board. The remainder of the Board's proceedings were conducted in camerâ.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee held at 11, Chandos-street, Cavendish-square, W. 1, 24 cases were considered and £389 10*s.* voted to 23 applicants. The following is a summary of some of the cases relieved:—

M.R.C.S. Eng., 1861, L.S.A., 1864, aged 85, widower, five children, three married. Practised in Wiltshire from 1866 to 1912. The eldest daughter, aged 62, and youngest, aged 53, look after the applicant. Total income from investments £120, and he receives £80 from married daughters. Owing to the cost of living applicant finds it hard to make ends meet, the income being inadequate for three people after rent and taxes have been paid, which amount to £55 per annum. Voted £26 in 12 instalments.

Widow, aged 45, of M.R.C.S. Eng. and L.R.C.P. Edin. who practised in Liverpool, British Honduras, and New Zealand, and died at Fazakerley Sanatorium, May, 1922. Fellow practitioners collected £40 towards the funeral expenses and debts. Owing to enforced removals on account of ill-health applicant's late husband was unable to provide for his wife and daughter aged 11, and had to realise life assurance policy to meet current expenses. Applicant received £9 from friends, and hopes to make about £10 12*s.* from stocking knitting. Voted £15.

Daughter, aged 61, of M.R.C.S. Eng. who practised at Nevin and died in 1865. She suffers from rheumatism and bronchitis. Applicant and her sister live together, and through being unable to let apartments this season find it hard to meet rent and expenses. Her share of the amount received by letting was £10. £5 was received from knitting. The sister is unmarried, aged 69, and owing to failing eyesight cannot do needlework as she has been accustomed to do. This sister also had £10 as her share of the letting, this being after payment of six months' rent, coals, &c. Rent £12. Voted £18 in 12 instalments, and a special grant of £6 towards rent.

Daughters, ages 58 and 50, of L.S.A. Lond. who practised at Plumstead and Ilford and died in 1903. Owing to chronic ill-health these ladies find it extremely difficult to manage on a joint income of £104 and the rent amounting to £34. Relieved 14 times, £189. On the recommendation of our visitor the grant of £18 was raised to £26 in 12 instalments.

Widow, aged 80, of L.R.C.P. Edin., L.S.A. Lond. who practised in Monmouthsire and died in 1889. Applicant lived with two nieces, and the three shared expenses and rent of a small flat. One niece is now dead and the second one has recently been taken to the infirmary owing to mental trouble. Applicant is now left with a total income of £45 per annum, out of which she has to pay rent and food. The Guild sent her an emergency grant of £3 and £1 for coal, and the Fund voted £18 in 12 instalments and a special grant of £7 10*s.*

Subscriptions may be sent to the hon. treasurer, Sir Charters Symonds, K.B.E., M.S., F.R.C.S., at 11, Chandos-street, Cavendish-square, London, W. 1.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Opening of the New Parliament.

THE new Parliament assembled on Monday, Nov. 20th. After three days occupied in the swearing-in of the new Members and in the re-election of Mr. WHITLEY as Speaker of the House of Commons, the session was opened by the King in State on Thursday, Nov. 23rd. His Majesty, in the gracious speech from the Throne, announced that the principal business of the present session will be the passage of the necessary legislation to give effect to the Irish Free State Constitution. Estimates for the public service will also be laid before the House of Commons. The continuance and extension of the ameliorative measures in regard to trade and employment prepared by the late Government were foreshadowed, and hopes were expressed for the success of the efforts at Lausanne to reach a settlement of the difficulties in the Near East.

In the debate on the Address in reply to the gracious speech in both Houses, the policy of the Government in regard to unemployment and foreign affairs were the chief topics. The Prime Minister (Mr. BONAR LAW) declined to respond to the demand of the Labour party for fuller details of the Government's policy on unemployment at this stage. He indicated that the session would be a short one. The pitched battle to which they were all looking forward could not come this session, therefore they might as well get it finished as soon as possible.

HOUSE OF COMMONS.

MONDAY, NOV. 27TH.

Meals for School Children.

Mr. TREVELYAN THOMSON asked the President of the Board of Education the total number of children attending elementary and secondary schools who were receiving school meals at the end of October, and for the same period last year; and the total cost in each case.—Mr. WOOD replied: The total number of public elementary school children in receipt of school meals under the former Provision of Meals Acts (now re-enacted in Sections 82 to 85 of the Education (Consolidation) Act, 1921) at the end of October, 1922, was 52,921, as compared with 100,266 at the end of October, 1921. I cannot give the total gross or net cost of meals provided up to that date, but the average cost per meal supplied during the year ending March 31st, 1922, was 3·88d. The Provision of Meals Acts did not extend to secondary schools.

Training of Disabled Ex-Service Men.

Mr. FREDERICK ROBERTS asked the Prime Minister whether it was proposed to accept the recommendations contained in the Report of the Select Committee on the Training and Employment of Disabled Ex-Service Men.—Sir MONTAGUE BARLOW (Minister of Labour) replied: The Government propose to proceed broadly on the lines recommended by the Select Committee, and I am inviting the Lord Mayors, Lord Provosts, and Mayors to set up the King's Roll Committees in their areas forthwith. It has also been decided to appoint a King's Roll National Council, and I am glad to be able to announce that Field-Marshal Earl Haig has consented to be chairman.

Future of the Ministry of Pensions.

Mr. LUNN asked the Prime Minister whether it was the intention of the Government to abolish the office of Minister of Pensions, and when they proposed that it should come into operation.—Mr. BONAR LAW replied: I am not yet in a position to give any answer to this question.

Stabilisation of Pensions.

Mr. CHARLES WHITE asked the Minister of Pensions whether he would assure the House that pensions to widows, children, totally disabled men, and others granted under the Royal Warrant of 1919, and subsequent Royal Warrants, would not be reduced during the three years commencing April, 1923.—Major TRYON replied: I am glad to inform the hon. Member that the Government have decided that the present rates of flat rate disablement, widows' and dependants' pensions shall not be revised under Article 24a of the Royal Warrant on account of the fall in the cost of living for a further period of three years from April 1st, 1923.

Housing Policy of the Government.

Mr. TREVELYAN THOMSON asked the Minister of Labour, as representing the Ministry of Health, whether, seeing that according to the official returns made by local authorities in 1919, after taking a survey of their housing needs as provided by the Housing Act of 1919, over 800,000 houses were then required to remove existing overcrowding, and that only about 200,000 houses had yet been built, what steps the Government proposed to take to remedy the continued existence of overcrowding.—Sir MONTAGUE BARLOW replied: My right hon. friend can only say that the whole question of future housing policy is receiving his careful consideration.

Milk and Dairies Act Regulations.

Mr. ALBERT ALEXANDER asked the Minister of Labour, as representing the Minister of Health, the date on which the draft regulations under Section 3 of the Milk and Dairies (Amendment) Act would be laid before the House for approval or criticism.—Sir MONTAGUE BARLOW replied: My right hon. friend hopes to be in a position to make the necessary order under Section 3 of the Act within the next few days. The order will then be laid before the House as required by Section 6.

Degree Standards in Indian Universities.

Colonel Sir CHARLES YATE asked the Under Secretary of State for India what steps were being taken to improve the standard of the degrees given by Calcutta and other Indian universities; and whether, failing improvement, orders would be given for the discontinuance of the Government grant.—EARL WINTERTON replied: The hon. and gallant Member will find general information on the subject in the Annual Report on Indian Education. I am not in a position to supply more detailed information. The matter is one for which the Ministers in charge of education in the several provinces and the provincial legislatures are now responsible.

TUESDAY, NOV. 28TH.

Ex-Service Men as Pauper Lunatics.

In reply to a number of questions Major TRYON (Minister of Pensions) laid down the principles in the Royal Pensions Warrant governing compensation to men whose disabilities were not due to their service.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj. F. E. Rowan-Robinson, half-pay list, late R.A.M.C., retires on account of ill-health.

Capt. A. B. Preston retires, receiving a gratuity.

Temp. Capt. N. E. Stewart relinquishes his commn. and retains the rank of Capt.

ARMY RESERVE OF OFFICERS.

Lt.-Col. P. J. Probyn and Maj. A. E. Milner, having attained the age limit of liability to recall, cease to belong to the Res. of Off.

The undermentioned cease to belong to the Res. of Off., on account of physical unfitness: Lt.-Cols. J. Cowan and M. W. Falkner, Maj. H. O. M. Beadnell, and Capts. A. W. Byrne and Cecil B. Hogg.

MILITIA.

Lt.-Col. A. A. Watson, having attained the age limit for retirement, is placed on the ret. list and is granted the rank of Col.

TERRITORIAL ARMY.

Maj. D. C. L. Orton to be Lt.-Col. and to comd. 4th (Cheshire) Cavalry Field Amb.

Capt. (Actg. Maj.) R. W. Swayne relinquishes the actg. rank of Maj.

The undermentioned officers having attained the age limit are retired, and retain their rank, except where otherwise stated: Lt.-Cols. A. B. S. Stewart and C. E. Humphreys (with permission to wear the prescribed uniform); Majs. J. Livingstone and F. W. Squair (with permission to wear the prescribed uniform); Capts. E. C. Hobbs and F. W. Brunker.

The undermentioned officers resign their commns. and retain their rank, except where otherwise stated: Maj. E. D. Gairdner (with permission to wear the prescribed uniform); Capts. C. W. T. Baldwin (granted the rank of Maj.) and A. A. Turner.

The undermentioned officers relinquish their commns. and retain their rank, except where otherwise stated: Lt.-Col. W. E. Foggie (with permission to wear the prescribed uniform); Maj. F. C. Whitmore; Capts. J. Everidge (granted the rank of Maj.), W. Rutherford, and N. MacInnes.

TERRITORIAL ARMY RESERVE.

Lt.-Col. A. G. Hamilton, from Genl. List, to be Lt.-Col.

Capts. H. J. Dunbar and S. McCausland, from Genl. List, to be Majs.

Capt. L. B. Stott, from Genl. List, to be Capt.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Dec. 4th.

TROPICAL DISEASES AND PARASITOLOGY: at 8.30 P.M.
Informal Evening:
The President (Sir Leonard Rogers) will give a Demonstration showing the Distribution of Leprosy throughout the World.
Prof. R. T. Leiper will show on the kinema a film entitled "British Guiana: its People, Natural History and Scenery" (kindly lent for the occasion by the British Guiana Government).
Specimens and photographs will be shown on tropical subjects of general medical interest.
The Chalmers Library will be open for inspection.
The Council of the Section cordially invites Members of other Sections to be present.
Light refreshments, smoking.

Tuesday, Dec. 5th.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)
Discussion:
On the Operative Treatment of Dislocation of the Hip, Congenital and Pathological, to be opened by Mr. H. A. T. Fairbank.
Those desiring to take part will be furnished with an abstract of the opener's paper on application to the Hon. Secretary, Mr. W. T. Gordon Pugh, Queen Mary's Hospital, Carshalton.
Cases:
Particularly those illustrating the subject of the discussion will be welcomed at 5 P.M.

PATHOLOGY: at 8.30 P.M.
At St. Mary's Hospital, Paddington.
Sir Almroth Wright: Immunisation in Vitro.
Dr. J. Freeman: Protein Sensitisation Experiments.
Mr. C. G. Schoneboom: Intertraction.
Mr. A. F. Hayden: Classification of Acne Bacilli.
Dr. A. L. Punch: Tubercle Complement Fixation with Cow's Serum.
Dr. A. Fleming, Mr. C. B. Dyson, and Mr. V. D. Allison: Antibacterial Properties of Egg White.
Mr. W. D. Newcomb and Dr. J. M. Ross: Demonstration of Pathological Specimens.

Wednesday, Dec. 6th.

SURGERY: at 5.30 P.M.
Discussion:
On Mistakes in Diagnosis and Treatment and the Lessons to be Learned from Them.
The President, Vice-Presidents, Members of Council, and others will take part.

Thursday, Dec. 7th.

OBSTETRICS AND GYNÆCOLOGY: Joint Meeting at 8 P.M.
THERAPEUTICS AND PHARMACOLOGY:
Paper:
Dr. H. H. Dale: The Value of Ergot in Obstetrical and Gynæcological Practice, with Special Reference to its Present Position in the British Pharmacopœia.
To be followed by a discussion.

Friday, Dec. 8th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.)
Cases. The following will be shown by:—
Dr. Bernard Myers: (1) Aneurysm Pressing on the Brachial Plexus. (2) Purpura Hæmorrhagica.
Mr. J. E. H. Roberts: Thrombo-Angeitis Obliterans.
Dr. George Evans: Thrombo-Angeitis Obliterans.
Dr. M. A. Cassidy: Scorbutic Infantilism.
Dr. E. Stolkind: Acromegaly (in girl aged 16). (Joint Meeting with the Section of Medicine.)

OPHTHALMOLOGY: at 8.30 P.M.
Joint Meeting with SECTION OF MEDICINE.
Continuation of the Discussion on the Significance of Vascular and other Changes in the Retina in Arterio-Sclerosis and Renal Diseases, commenced on Tuesday, November 28th.
Those wishing to take part in the Discussion are requested to send their names to Mr. Montague Hine, 30, Weymouth-street, W.1.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
FRIDAY, Dec. 8th.—5 P.M., Sir William Thorburn: The Surgery of the Spinal Cord. (Bradshaw Lecture.)

FELLOWSHIP OF MEDICINE POST-GRADUATE LECTURES, 1, Wimpole-street, W.
THURSDAY, Dec. 7th.—5 P.M., Dr. R. Hutchison: The Diagnostic Significance of Abdominal Pain.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Dec. 4th.—10.30 A.M., Mr. Maingot: Surgical Ward Cases. 12.15 P.M., Dr. Burnford: Pathological Demonstration. 4.30 P.M., Dr. Grainger Stewart: Demonstration of Examination of Selected Cases.
TUESDAY.—10 A.M., Dr. Paterson: Demonstration of Medical Cases. 12 noon, Mr. Sinclair: Surgical Diseases of Abdomen. 4.30 P.M., Dr. Pritchard: Gastric Ulcers.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12 noon, Mr. Simmonds: Demonstration of Fractures.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 12 noon, Dr. Scott Pinchin: Disease of the Heart. 4.30 P.M., Mr. MacDonald: Urinary Surgery.
FRIDAY.—11 A.M., Dr. McDougal: Electrical Department. 12.15 P.M., Dr. Burnford: Applied Pathology. 4.30 P.M., Dr. Grainger Stewart: Demonstration of Examination of Selected Cases.
SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Simmonds: Orthopædics. 10.30 A.M., Mr. Maingot: Surgical Pathology.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M.: In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham.
WEDNESDAY, Dec. 6th.—4 P.M., Dr. Grainger Stewart: Suggestive Therapeutics.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Dec. 4th.—10 A.M., Mr. W. E. Tanner: Surgical Out-patient Clinic. Mr. N. Fleming: Eye Cases and Operations. 3.30 P.M., Dr. A. J. Whiting: Auricular Fibrillation.
TUESDAY.—3 P.M., Mr. J. Howell Evans: Surgical In-patients. 4.30 P.M., Mr. C. H. Hayton: Middle-Ear Deafness. 5.30 P.M., Dr. C. E. Sundell: Children In-patients.
WEDNESDAY.—2 P.M., Mr. C. H. Hayton: Throat Operations. Mr. T. H. C. Benians: Cardiac Infections.
THURSDAY.—2 P.M., Mr. J. Bright Banister: Gynæcological Operations. 3.30 P.M., Dr. J. Metcalfe: Radiology.
FRIDAY.—12 noon, Mr. T. H. C. Benians: Pathological Demonstration.
SATURDAY.—10 A.M.: Surgical Operations. 3 P.M., Surgical In-patients.
Daily, 2.30 P.M.: Operations, In- and Out-patient Clinics in General and Special Departments, &c.

NORTH-EAST LONDON CLINICAL SOCIETY, Prince of Wales's Hospital, Tottenham, N.
THURSDAY, Dec. 7th.—4.15 P.M., Dr. A. Lloyd-Williams: Cases of Skin Disease (followed by discussion and cases).

THE NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, London, W. 1.
MONDAY, Dec. 4th.—10 A.M., Out-patients: Dr. J. Strickland Goodall. 5.30 P.M., Dr. F. W. Price: Diseases of the Arteries.
TUESDAY.—10 A.M., Out-patients: Dr. B. T. Parsons-Smith. 2 P.M., Out-patients: Sir S. Russell-Wells.
WEDNESDAY.—10 A.M., Out-patients: Dr. John Parkinson. 2 P.M., Out-patients: Dr. R. O. Moon.
THURSDAY.—2 P.M., Out-patients: Dr. F. W. Price. Ward Round: Dr. R. O. Moon.
FRIDAY.—10 A.M., Out-patients: Dr. B. T. Parsons-Smith. 3 P.M., Dr. John Parkinson: Aneurysm of Aorta.
SATURDAY.—11 A.M., Ward Round: Dr. P. Hamill.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
THURSDAY, Dec. 7th.—5 P.M., Dr. W. Griffith: Eczema.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Dec. 7th.—4 P.M., Dr. Pearson: Dyspnœa.

MANCHESTER FRENCH HOSPITAL AND HOSPITAL FOR WOMEN, 24, Acomb-street, Whitworth Park.
THURSDAY, Dec. 7th.—4.15 P.M., Dr. N. C Haring: How to Examine the Nose and Throat: Nasal Disease and Obstruction.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, Dec. 5th.—4.15 P.M., Dr. J. Gray Clegg: Glaucoma.

SALFORD ROYAL HOSPITAL POST-GRADUATE LECTURES.
THURSDAY, Dec. 7th.—4.30 P.M., Mr. J. B. Macalpine: The Treatment of Cystitis.

UNIVERSITY OF SHEFFIELD—FACULTY OF MEDICINE Post-Graduate Lectures and Demonstrations.
TUESDAY, Dec. 5th.—3 P.M. (at the University) Prof. Leathes: Significance of Basal Metabolism in Health and Disease.
FRIDAY.—3 P.M. (at the Royal Hospital) Mr. Graham Simpson: Clinical Cases. 4 P.M., Dr. Wilkinson: Diseases of the Accessory Sinuses of the Nose.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Dec. 6th.—4 P.M., Mr. C. W. Hutt: Medical Inspection in Secondary Continuation Schools.

Appointments.

BROWN, R. C., M.B., B.S. Durh., has been appointed Tutor in Obstetrics at Leeds University and Resident Medical Officer, Leeds Maternity Hospital.
CAMPBELL, W. S., M.D., C.M. Edin., Hon. Surgeon to the Victoria Cottage Hospital, Sidmouth.

DIAS, D. A., L.R.C.P. Edin., L.D.S. Liverp., House Surgeon, Eccles and Patricroft Hospital.
MOCATTA, SYBIL, F.R.C.S. Eng., Resident Medical Officer at Queen Charlotte's Lying-in Hospital.
SAUNDERSON, A. E., M.R.C.S., L.R.C.P. Lond., D.P.H., and WOOD-WHITE, B., M.B., Ch.B., D.P.H., Assistant Tuberculosis Officers for East Suffolk.
SHATTOCK, C. E., M.D., M.S. Lond., F.R.C.S. Eng., Assistant Surgeon to the Cancer Hospital.

Vacancies.

For further information refer to the advertisement columns.

Birmingham and Midland Eye Hospital.—Res. S.O. £120.
Birmingham, St. Chad's Hospital.—Res. M.O. £100.
Bradford Children's Hospital.—H.S. £150.
Bristol General Hospital.—Hon. Clin. Assts.
Brixton Dispensary, Water Lane, Brixton, S.W.—Gynæcologist.
Cairo School of Medicine, Egypt.—Radiologist, &c. L.E.480.
Cancer Hospital, Fulham-road, S.W.—H.S. £150. Also Surg. Reg.
Central London Ophthalmic Hospital, Judd-street, W.C.—Rhinologist.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. £75.
Chester Royal Infirmary.—Hon. Asst. Ophth. Surg.
City of Westminster Union Infirmary, 369, Fulham-road, S.W.—Third A.M.O. £300.
Croydon Borough Hospital for Infectious Diseases.—Asst. Res. M.O. £350.
Douglas, Isle of Man Mental Hospital.—Asst. M.O. £300
Durban Suburbs, Union of South Africa.—M.O. £800.
Ealing Borough.—Asst. M.O.H. £550.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.P. and H.S., also Cas. M.O. and Cas. S.O. Each £150.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—S. for Ear, Nose, and Throat Dept.
Hospital for Sick Children, Great Ormond-street, W.C.—Hon. S. £50.
Leeds General Infirmary.—Res. Orthopædic O. £150.
Lincoln County Hospital.—Jun. H.S. £150.
London County Mental Hospital Service.—Seventh A.M.O. £300.
London Hospital, Whitechapel, E.—Obstet. Reg. £365.
London Lock Hospital, Dean-street, and Harrow-road.—Surg. Reg.
London Temperance Hospital, Hampstead-road, N.W.—Cas. O. £150.
Newcastle-upon-Tyne, Hospital for Sick Children.—Hon. S. to Throat and Ear Dept.
Newcastle-upon-Tyne, University of Durham College of Medicine.—Jun. Demonstrator of Anatomy. £350.
Norwood and District Cottage Hospital.—Hon. Anæsth.
Norwood Treatment Centre for Children.—Vacancies in Throat, Eye, &c., Depts.
Oldham Royal Infirmary.—H.S.'s. Each £200.
Orford, Radcliffe Infirmary and County Hospital.—Cas. H.S. and Res. Accoucheur. Each £200.
Portsmouth Royal Hospital.—H.S. £150.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Anæsth. £20.
Queen Mary's Hospital for the East End, Stratford, E.—H.P. £150.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. S. to Ear, Nose, and Throat Dept. Hon. P. to Out-patients. Also H.P. £100.
St. Bartholomew's Hospital Medical College.—University of London Chair of Anatomy. £1000.
St. Mary's Hospital, Paddington, W.—Med. Reg. £200.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Part-time Pathologist. £300.
West London Hospital, Hammersmith-road, W.—H.P., H.S., Aural H.S., and Res. Cas. O. Each £100.
Westminster Hospital, Broad Sanctuary, S.W.—Asst. S.
York County Hospital.—H.P. £150.

Births, Marriages, and Deaths.

BIRTHS.

DUNCAN.—On Nov. 24th, at Gay-street, Bath, the wife of W. H. Duncan, F.R.C.S., of a daughter.
WARNER.—On Nov. 17th, at Rydal, Woodford Green, Essex, the wife of Dr. H. P. Warner, of a daughter.

MARRIAGES.

THOMPSON—DONALDSON.—On Nov. 23rd, at All Saints', Paston, Peterborough, Captain Ralph Reakes Thompson, M.C., R.A.M.C., to Eanswythe Frances, youngest daughter of the Rev. Canon F. Lewis Donaldson and Mrs. Donaldson, of Paston, Peterborough.

DEATHS.

LLOYD.—On Nov. 23rd, at Ashcroft, Drayton, Somersetshire, Surg. Lieut.-Colonel John Daniel Lloyd (late of Chirk), aged 72 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Dr. P. J. Kelly (Surgeon-General) has been appointed by the King a Member of the Executive Council of the Colony of British Guiana.

Notes, Short Comments, and Answers to Correspondents.

MEDICAL RECONSTRUCTION IN RUSSIA.

WE have received from the headquarters of the Friends' Emergency and War Victims Relief Committee a summary of the report for September, 1922, of Dr. Melville D. Mackenzie, senior medical officer of the British and American Friends Russian Relief Unit. The report was written at Buzuluk, in the Samara province—an area which has suffered during the past six or seven years from revolution, constant fighting, famine, and epidemic typhus.

Activities of the Unit Summarised.

The various forms of work now going forward include the following: (1) Typhus precautions, consisting of quarantine, laundry, disinfection, delousing and bathing arrangements, and establishment of a sanitary guard at Buzuluk station; (2) gifts of food and equipment to 10 hospitals, sufficient to enable them to function satisfactorily for two months, after which they will again be surveyed; (3) ambulance arrangements (provision of carts, sledges, and wheeled stretchers); (4) acceptance of full responsibility for the Buzuluk epidemic hospital during six months, after which it is hoped to hand it over to the local authorities; (5) organisation of a dispensary which in September issued drugs, instruments, and vaccine to 80 institutions; (6) preparation of a bacteriological laboratory, equipment for which is to come from England; and (7) preparation of a house for a children's home, which will probably be opened during this month.

Condition of the District.

Passages extracted from a letter written by Dr. Mackenzie give a distressing picture of the condition of the Buzuluk district. When the harvest failed last year the hospitals at once became overcrowded, and later existed simply as depositories for the sick and dying, who were frequently heaped up on one another, as the area of the wards was not sufficient to hold them in a single layer. All material, equipment, and instruments of any value disappeared. The staff became heavily infected with typhus; many died, and others fled. After the thaw in the spring and with the establishment of systematic feeding the condition of the people improved, but the death-rate from disease remained terribly high. Extensive eating of grass led to dropsical illnesses; the typhus and relapsing fever epidemic was then at its height, and scurvy was common throughout the population owing to the lack of fresh vegetables. Inadequate clothing, exposure, and famine conditions generally caused much nephritis and an appalling increase in tuberculosis; there were large numbers of cases of gangrene requiring skilled surgical attention; and of acute intestinal and dysenteric conditions, and of grave anæmias, all directly consequent upon famine conditions. As summer advanced the dysenteric illnesses increased very greatly, and cholera was introduced by refugees returning from Tashkent. In July an extremely widespread and severe epidemic of malignant malaria began, and has continued up to the present time; it is directly due to the enfeebled condition of the whole population, and is frequently a recrudescence of old infection. This epidemic has resembled in its severity, death-rate, and pandemic character the epidemics of influenza that visited England in 1918 and 1919. Whole village populations have been attacked, generally with a very high death-rate. In one children's home of 120 children 90 cases occurred within two days. Typhus, which died down but did not entirely disappear during the summer, reappeared this winter, together with relapsing fever. The hospitals and medical personnel in the villages were quite inadequate to meet this very great strain put upon them. The failure of the harvest was due to the very small amount of seed sown in the spring, owing to the almost entire absence of horses and the weakness of the peasants, and also to storms of locusts during the summer, and the activities of the ground rats. The ration given the people, though sufficient to maintain life, is far below that desirable for a population which has suffered previously from poverty and extreme famine. A further responsibility was thrown on the Unit by the necessity of equipping, staffing, and providing the necessary medical needs for children's homes. These homes are the products of the famine; and in the Buzuluk area alone about 8000 children lost their parents through famine and typhus last year. The ages of the children vary from 1 year old (very few) to 14 or 15 years of age, and the homes contain numbers varying from 30 to 150. In this medical reconstruction work the Government, owing to their extreme financial difficulty, has been unable to give help. With reference to the equipment of hospitals, the greatest present need is for blankets and sheets, and the means of doing

further bacteriological work. Until the opening of the Buzuluk laboratory Dr. Mackenzie's own microscope was the only one in an area about as large as Wales. A large amount of tuberculosis, especially amongst children of school age, necessitated the opening of a school-children's clinic, primarily for tuberculosis, but also to deal with school-children suffering from anæmia, malignant malaria, rickets, and allied conditions. It is hoped that later a sanatorium for tuberculosis may be opened, to which children will be admitted from the clinic. This is very urgently needed.

Cholera.

In connexion with the cholera inoculation campaign in the summer, the districts north, south, and west of the Buzuluk area were devastated by cholera, and in one neighbouring town at one time over 300 cases a day were occurring. In the Buzuluk area itself the disease appeared in the form of small epidemics, which never spread, and which were traced to importation by a refugee or returning resident. The absence of epidemic cholera Dr. Mackenzie believes to have been probably due to the very large number of people inoculated against the disease. In Buzuluk town alone one doctor did over 4000 inoculations out of a population of 100,000, approximately 100,000 were rendered immune. In view of these results, this winter inoculation against typhoid fever and small-pox will be undertaken.

Pressing Requirements.

Future work will be limited entirely by the funds available. The need for a hospital for tuberculosis, especially skin and bone tuberculosis in children, is very great; much of the pulmonary tuberculosis in children could be prevented or cured by provision of an institution, where a more liberal diet than the ordinary ration could be provided, and where the children could be properly looked after as regards clothing and rest. The clothing which is required is that for children between the ages of 4 and 14, and should as a primary consideration be warm. Relatively less underlinen is required. Soap, towels, hand-basins, pillow-slips, tooth-brushes, hair-brushes, metal mugs, plates, knives, forks, and spoons, are also urgently needed. For the children's homes the most urgent need is still warm clothing and boots. Good warm serge or knitted garments are required not for babies but for children from 10 to 14 years particularly. Great quantities of waterproof sheeting are urgently needed for all hospitals and children's homes.

SMOKE ABATEMENT.

ON Nov. 22nd ex-Bailie W. B. Smith, of Glasgow, a member of the Departmental Committee on Smoke Abatement, presided over by Lord Newton, lectured on "The Economy of Smoke Abatement" before the Royal Society of Arts. On that day London emerged from more than 36 hours' continuous darkness, which afforded an excellent illustration of the conditions rendered possible by the smoke nuisance in our large cities. Two days later Mr. Justice Greer, in the course of his charge to the grand jury at the opening of Leeds autumn assizes, remarked on his dismay at the "dim, gloomy, and grimy" condition of the city of Leeds, and at the character of the calendar and the nature of the offences to be brought before him. "I am not at all sure," he observed, "that there is not some connexion between the two things." Pending the introduction of more considerable reforms he considered that stricter administration of the existing law would do something towards improvement.

Government Responsibility.

It will be remembered that Lord Newton's Bill for the Abatement of Smoke and Noxious Vapours was to have been considered by the Lords before Christmas but for the dissolution of Parliament. A gradually widening interest in the importance of the question is evident, and the work of Lord Newton's Committee should ensure support for the Bill from all who trouble to find out the facts relating to the economic necessity for coal conservation and the importance of the labour-saving and public health aspects of the smoke problem. We have referred in these columns to the recommendations of Lord Newton's Committee;[1] Mr. Smith, in the course of his lecture, stated that he could not find that any action had been taken by the Ministry of Health to enforce, or even to suggest, the application in the State-aided housing schemes of the economical methods recommended by the Committee for warming rooms, for cooking, and for the provision of hot water, with little or no production of smoke; in face of the reluctance of Government departments to become active in the matter, it was left to private enterprise to offer smokeless methods that might appeal to the householder by their convenience and economy.

Domestic Smoke.

It was stated in evidence before the Departmental Committee that even in industrial areas a large proportion of impurities in the air were from domestic type fireplaces[2]—in Leeds quite 50 per cent., in Manchester even more. In Glasgow, in winter time, it might be up to 80 per cent., except when the wind was easterly and smoke came from industrial areas beyond the city boundaries, where local authorities took no action against manufacturers. In London it seemed about the same as Glasgow, as similar amounts and composition of the impure deposit are recorded in both cities. In 1910 Mr. Smith, addressing a meeting of gas managers, foretold a greatly increased demand for gas for domestic use, and pointed out the need of a process of making gas that would produce, at the same time, a coke that could be used as a smokeless fuel, instead of coal, under all ordinary conditions; after long and careful investigation of numerous processes, he found one—the Maclaurin process of low temperature carbonisation—which seemed to meet both demands. About the cheapest schemes of all for detached houses appeared to be that seen by the Departmental Committee at the Austin Motor Co.'s village at Northfield, near Birmingham. In each cottage was a small boiler, burning coke, which warmed the whole house by means of a radiator in each apartment, and supplied hot water for every purpose. To do this only required about five tons of gas-works coke per annum; the cooking and lighting were done by gas. In addition to the saving of cost to the occupier, there was considerable saving in structural cost, as the installation of boiler, radiators, &c., was about £30 less per house, than if it had been fitted with the old-fashioned coal-burning grates and the necessary fireplaces and chimneys. For houses built on the tenement system and for detached houses fairly close together, a hot water system supplied from a central boiler installation would be still more economical and labour-saving for the occupier. A great majority of British people, however, wanted to see the fire itself, preferring radiant heat to convected heat from hot water radiators. To meet their wishes and avoid the smoke, waste, and extravagance of the old-fashioned fire, the Committee recommended the use of gas on grounds of its better utilisation of heat, cleanliness, and the ease of its intermittent use—these advantages often more than compensating for the higher price of gas when measured by thermal units. "The balance of economy in favour of gas," Mr. Smith pointed out, "is so slight at the present time that no great impetus is given to its more general adoption, although no doubt, it is steadily but slowly gaining ground; but if the cost of the gaseous therm can be reduced to one-third or one quarter of its present cost, the balance will then swing so strongly in favour of gas as to make its development extremely rapid." With regard to electricity, the Committee stated that it had also been urged as an efficient method for cooking and for warming rooms, but not, owing to its present cost, for heating water: they hesitated to advise its adoption in view of the high price at present charged for electricity in many localities. Where it was decided to instal electricity for lighting, and a reasonable price was charged for current, the house should be equipped with the coke-fired boiler in the living room and wash boiler in the scullery, as in the gas house, but the cooker would be electric, and in each bedroom would be an electric radiator.

Patent Fuels.

A consultative committee of fuel experts attached to the Patent Fuel Marketing Company, of 16, Pall Mall East, has lately been established in London. These experts are prepared to advise housewives and others as to the best type of the many smokeless solid fuels suitable for special purposes, and put them in the way of getting such fuels delivered instead of raw coal. The various problems of production of gas, electricity, and smokeless solid fuel have been fully dealt with by Mr. J. Arthur Greene, of the Institute of Petroleum Technologists, and Dr. F. Mollwo Perkin, Ph.D., in the latest book in a series "Common Commodities and Industries"[3] entitled "'Patent' Smokeless and Semi-Smokeless Fuels." This book gives many scientific details of great value, but is essentially a book for the public. The authors have made a detailed investigation into such smokeless solid fuel as can be burned in existing grates; their work is a useful contribution to the literature of the subject, containing a wealth of information which will be of value to all who are interested in the urgent national problems of coal conservation and smoke abatement.

THE PASTEURISATION OF THE PUBLIC MILK-SUPPLY.

BEFORE a large audience Prof. Henry Kenwood delivered a public lecture upon this subject at University College on Nov. 23rd. He pointed out that it is in the interests both of the milk industry and of the consumer that milk should be clean and safe. But in this direction little progress has been made over the country generally; as the consequence,

[1] THE LANCET, 1922, i., 706.

[2] See also THE LANCET, 1922, ii., 424.

[3] London: Sir Isaac Pitman and Sons, 1922, pp. 109, 3s.

preventable sickness and mortality from raw cow's milk remain, there is a growing public distrust of raw milk, and there is a huge sale of imported condensed and powdered milk. What is the remedy, having regard to the fact that the consumption of this uniquely valuable and vulnerable article of food ought to be increased without serious addition to its cost?

We shall not obtain clean milk by methods, he said, which have hitherto failed. The remedy is to deal with the ignorance and indifference of the unfit elements in the trade as we are dealing with unfit mothers—namely, by the appointment of specially trained officials to educate by advice and demonstration. But education is a slow process. Does the pasteurisation of fresh milk afford the best solution to the problem, for the meantime at least? Pasteurisation by the trade is a growing practice in this country. Some 60 per cent. of the entire public milk-supply of London is now so treated. In New York and some others of the large American cities no other milk save graded milk is permitted to be sold, and our Government in its recent Milk Act has recognised this method as one which confers safety when it is properly carried out under standardised conditions.

A clean milk-supply, Prof. Kenwood went on to say, is a large part of the demand for safe milk, but it does not meet the whole demand. If the risk from tuberculosis is to be removed, the milk must also be obtained from healthy animals. It may be accepted as scientifically established that efficient low-temperature pasteurisation of milk not only retards its souring for many hours without damaging its physical characters or its digestibility, but is also capable of destroying the germs of all those diseases which are known to be at times milk-borne. Prof. Kenwood approved of the "grading" of milk, more particularly because of its object-lesson of the defects and deficiency of the ungraded raw article to producers, traders, and the public alike: but the bulk of the trade cannot supply it and the bulk of the people cannot afford to purchase it.

Trade pasteurisation of milk has been adopted from commercial considerations, but it is being made increasingly efficient and so constitutes a valuable protection in childhood. The "acid-test" of efficiency is the removal of the risk from tubercle. He would like to see trade pasteurisation grow; the movement should be encouraged and directed so that the optimum results from the public health standpoint may accrue. Taking the lead from America, the pasteurisation of the whole of the milk-supply in our large towns should ultimately be made compulsory; for in our large towns the raw milk-supply, owing to the long distances between the cow and the consumer, was often the least desirable in this country.

Prof. Kenwood then critically considered all the points which had been raised against the pasteurisation of milk, and concluded that if the maximum concessions were made to those who advanced such objections, the advantages of pasteurised milk bulked very largely in comparison with its disadvantages. When trade pasteurisation is officially recognised or made compulsory in large cities, certain requirements would have to be imposed upon the trade. These were indicated by the lecturer, who in conclusion gave a survey of the growth of heated milk in this and other countries, and of medical opinion in favour of it. Pasteurisation and bottling of raw milk form, he said, a path of safety and wisdom, and they need not prejudice the campaign for clean milk because producers can easily see that the cleaner the milk the better its taste and the better its keeping qualities after pasteurisation. There were many recorded efforts, but Prof. Kenwood had yet to learn of a large community in which the public milk-supply had been made safe to the child population except by the simple, cheap, and efficient means of heating it. No measure of equal safety was available without doubling the price of milk.

DID SIR ISAAC NEWTON SUFFER FROM INFLUENZAL ENCEPHALITIS?

THIS question is raised by Dr. Erich Ebstein of Leipzig in the *Münchener medizinische Wochenschrift* for Oct. 27th, and he is inclined to answer it in the affirmative. But his evidence seems to be largely of a hearsay character. One of his authorities is a certain Dowson, whose original work Dr. Ebstein has not been able to trace. There is, therefore, some doubt about Dowson's opinion that in 1693 Newton suffered from mental disturbances due to influenzal encephalitis. One point is, however, perfectly clear; in October, 1693, London was visited by an epidemic of influenza or a disease resembling influenza. On Sept 13th of this year Newton wrote to Pepys that for the past 12 months he had neither eaten well nor slept, and that he no longer possessed his former powers of concentration. Newton was said at this time to be suffering from slight melancholia and irritability. In the winter of 1692–93 he certainly did suffer from disturbances of sleep, for in a letter dated Oct. 5th, 1693, he wrote from Cambridge that in the winter which had passed he had cultivated the bad habit of falling asleep by the fire, and that an illness, which had been epidemic during the previous summer, had upset him so badly that for a fortnight he had not slept one hour in a single night, and for five days he had not slept at all. He could remember having written on an earlier occasion to his correspondent, but his memory failed him concerning the contents of his letter. Another link in the chain of evidence is the gossip of one of Newton's servants who said that when Newton's breakfast was brought him in the morning, he was often found sitting in the same posture in which he had last been seen on the previous evening. On the basis of this fragmentary evidence, Dr. Ebstein concludes that it is not improbable that Newton contracted influenza in 1693, and that the symptoms referred to were due to encephalitis.

ARITHMETICAL PRODIGIES.

To the Editor of THE LANCET.

SIR,—In the note on Mr. Numair's study of calculating prodigies in THE LANCET of Nov. 18th it is stated that "we infer that the calculating prodigy is a creature of brilliant mind not broadened by other forms of culture, a primitive with a freak intellect." This statement does but scant justice to a phenomenon which raises many interesting psychological problems.

The subject has been discussed at some length by the late Frederick W. H. Myers in Chapter III. of his "Human Personality," where he gives a table of some of the better known examples. There are certain characters which are common to this type of precocity. The sporadic appearance, the sex-limitation (it is strictly confined to boys), the frequent evanescence in later life and its entire independence of the general intelligence, all seem to point to the existence of some ontogenetic evolutionary factor. Thus Gottfried Dase, who "in twelve years made tables of factors and prime numbers for the seventh and nearly the eighth million" (Myers, op. cit.) and received a grant from the Hamburg Academy of Sciences for his mathematical researches, was little more than an imbecile and could never master the simplest proposition in Euclid. I have myself talked to an idiot in an institution at Alsterdorf, whose mental powers were so feeble that he could only be employed in mat-making, yet who in one second calculated the day of the week in which my birthday would fall in that year, naming it "soup day," that article being the most prominent in the dinner menu on Tuesdays. It appears that a distinction must be made between that general all-round mental efficiency which we call intellectual ability and the capacities for making mental acquisitions of a specific character, such as calculation, the power of learning to read and write, musical or pictorial capacity, and the like.

In no specific capacity is there greater variability of distribution than in that of the power of abstract calculation. When Francis Galton set himself to investigate the distribution of intellectual capacity and hereditary genius he took as a measure of the wide differences in mathematical ability the number of marks which separated the Senior Wrangler from the next in order in the mathematical tripos, and from the lowest on the list—the winner of the "wooden spoon." Prof. A. R. Wallace writes ("Darwinism," p. 471), commenting on this variability, "Probably fewer than one in a hundred really possess the mathematical faculty, the great bulk of the population having no natural ability for it." Yet this special capacity has reached in individual cases a more supreme development than any other, culminating in the mathematical genius of such men as Newton, Gauss, Laplace, Raleigh, or Einstein.

It appears probable that, since recent acquisitions in the evolution of the race show more instability and wider variations than those of more ancient date, the wide variations in the capacity for reading, acquisition of foreign languages, calculation, music, &c., are to be explained by their recent appearance in the development of the human race. Hart and Spearman[1] and others have shown that intellectual capacity and the aptitude for making mental acquisitions depend upon two factors—viz: (1) The general intelligence factor, or innate all-round mental efficiency, which is correlated with the general energy of the whole brain-cortex; and (2) the specific capacities, each of which appears to be correlated with the proper functioning of special systems of nerve cells, more or less focal in certain areas of the cortex. Experience teaches us that general intellectual capacity is thus a function of two variables, but that these two factors may vary independently. This variability shows itself both in the period of emergence and in a tendency to precocity and also in the degree of capacity finally attained.

In many cases there is also a tendency to late emergence, in which case the capacity may be termed "larval." The condition known as word-blindness affords a very good

[1] Journal of Psychology, vol. v., pt. 1, p. 57.

example of this process. The inability to retain in memory the meaning of written symbols is by no means uncommon. It may be partial or complete, and may be associated with a reduction in general intelligence or with good general ability. It is much more common in boys than in girls, and there is a tendency for it to show itself in several generations, possibly transmitted through the female line. The condition very often disappears during adolescence. It is highly probable that the capacity for calculation belongs to the same order of phenomena. It may be remarked that high calculating capacity is not uncommon amongst peoples with a long history of civilisation and learning behind them, as amongst the natives of India, several of whom have been high wranglers at Cambridge. Moreover, the calculating boy is also found; a Cingalese example was investigated a few years ago. On the other hand, amongst native races which have only recently emerged from barbarism, arithmetical capacity is almost entirely wanting. Thus in Uganda the quickest-witted native cannot get beyond simple fractions.

These facts seem to support the theory of a biological factor and effectively to dispose of the suggestion "that calculating boys owe their powers mainly to early environment," or the inference that the counting of sheep is an occupation likely to produce Senior Wranglers. A lightning calculator with whom I am acquainted, whose mathematical tables are largely used by engineers, was the son of a shepherd. Perhaps it will be argued that this is an example of the inheritance of acquired characters!

I am, Sir, yours faithfully,

G. A. AUDEN, M.D., F.R.C.P.

Birmingham, Nov. 19th, 1922.

COLONIAL HEALTH REPORTS.

Gold Coast.

A report on the Blue-book for 1920, delayed in publication, states that the population of the colony and its dependencies totalled 1,503,386. During 1920 there were 2818 Europeans resident, 775 of these being classified as official, 1506 as mercantile, 465 as mining, and 72 as missionary. Amongst the Europeans there were 1 birth and 32 deaths during the year, and amongst natives there were 2074 births and 3195 deaths. A summary of the principal causes of death at all ages shows that intestinal diseases accounted for 19 per cent. and the pneumonia group for 14 per cent.; 6 per cent. of the deaths were due to tuberculosis (including phthisis). The invaliding rate amongst Europeans was 34·06 per 1000. Treatment was given in 4705 cases of malaria, 824 of dysentery, 3 of yellow fever, 422 of pneumonia, 355 of tuberculosis, and 27 of sleeping sickness. Of 36 cases of blackwater fever 7 proved fatal. The special feature of the year was a severe outbreak of small-pox in Accra and surrounding villages, involving 70 deaths. The rainfall during the year was well below the mean of the previous three years, and varied from 15·87 inches at Accra to 31·13 at Cape Coast, 50·98 at Coomassie, and 68·19 at Tarquah. At Accra the mean shade temperature for the year was 80·48° F., at Coomassie 79·00°, and at Seccondee 81·22°. The climate, though hot and damp, is cooler than that of most tropical countries situated in the same latitude. It is not in itself unhealthy, but an evil reputation has been earned for it in the past by the prevalence of mosquito-borne diseases, against which all possible precautions have constantly to be taken. "The Gold Coast is peculiarly free," the report adds, "from many of the discomforts associated with tropical countries; hot nights and intense heat by day are the exception rather than the rule, while insects are comparatively unobtrusive. The efforts of the medical and sanitary authorities in promoting the treatment of disease and the knowledge of general hygiene continue to exercise a beneficial effect on the general health of Europeans."

Northern Territories of the Gold Coast.—In a report for 1921, signed by Mr. H. W. Leigh, Acting Chief Commissioner, it is stated that of 63 European officials 2 died and 4 were invalided. A census of the native population, including the mandated areas, was taken under considerable difficulties, and showed a total of 603,454—320,163 males and 283,291 females—as against 361,000 odd in 1911. Without mandated territory it amounted to 527,914. The increase is due to natural causes, in spite of epidemics, and the fact that the country has become much quieter during the last decade, so that it was possible for political officers to penetrate areas which could only be guessed in 1911. The general health of the natives was described as fair. There was a good deal of pneumonia in the Harmattan, and ulcers, elephantiasis, and guinea-worm are always to be seen in the bush villages. Ulcers seem more especially to attack children. There is a certain number of lepers in the Protectorate, but the disease does not appear to be on the increase, and the people do not seem to have the slightest fear of it. The water-supply is obtained from wells for the most part, except in one favoured station, where there is a spring. The supply is fairly adequate, but can always be increased when necessary by adding more wells, water being easily found, generally at a depth of 30 feet. It is always necessary, however, to boil and filter the water. There are native hospitals and dispensaries in most of the stations where there are Europeans. Medical officers are few, but they do a certain amount of travelling.

AN UNSUCCESSFUL STEINACH OPERATION.

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 25th there is a brief account of vasectomy performed for hypertrophy of the prostate. In this operation the duct remains open, the sperm cells continue in full activity, the interstitial cells remain unchanged, and nothing whatever happens. The operation is useless except for producing sterility without diminishing potency. *Vasectomy is exactly what the Steinach operation is not.* Here the vas is ligated, the opening is obliterated, the sperm cells atrophy, the interstitial cells become overactive, and a rejuvenation takes place. The Steinach operation is indicated for premature senility, for nervous breakdown, and for cases where (owing to weakness or age) the repressed complexes gain the upper hand and produce mental disturbance or bodily breakdown. The case reported in your item cannot be called an "unsuccessful Steinach operation," as no Steinach operation was performed.

I am, Sir, yours faithfully,

E. W. SCRIPTURE.

Welbeck-street, W., Nov. 26th, 1922.

*** The physiology underlying Steinach's work is questionable. We do not even know that the interstitial cells are responsible for the production of an internal secretion. Ancel and Bouin tied the vas and found that whereas the tubules atrophied the interstitial cells increased in number. Subsequent observers have not all confirmed these observations and the effect of tying the vas seems to vary. One important point is whether the nerve supply to the testis is included in the ligature or the section. If it is, atrophy of both elements occurs. Dr. M. Retterer and a school of German workers claim that the interstitial cells of the testis serve to provide nutriment to the tubules, and that the tubules are responsible for both internal and external secretion. Where the underlying basis is so precarious, it seems idle to emphasise the difference between section and ligature.—ED. L.

CHARGE AGAINST AN ASYLUM DOCTOR.

To the Editor of THE LANCET.

SIR,—In view of the publicity given in your issue of June 24th, 1922 (p. 1272), to the statement of the late Minister of Health, that my complaint against an asylum doctor for the fraudulent use of the diagnosis of dementia præcox has been investigated, I respectfully beg that you will give equal publicity to my absolute démenti to this. I hold the written statement of the Board of Control that not only they will not investigate my complaint, but that such complaints are never investigated.

I am, Sir, yours faithfully,

Nov. 22nd, 1922. THE GRADUATE CONCERNED.

PORTUGUESE HEALTH RESORTS.

To the Editor of THE LANCET.

SIR,—I shall be glad to have from your readers some information about the Southern Portuguese health resorts, Mont Estoril and others, and whether they suit cases of rheumatoid arthritis. Also whether the climate of Seville in winter is favourable for the same trouble. Is there any recent handbook about that region?

I am, Sir, yours faithfully,

Nov. 28th, 1922. H. E.

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